MODERN PLASTICS

APRIL 1950

It pays to use your custom molder's know-how

you may find you need fewer parts!

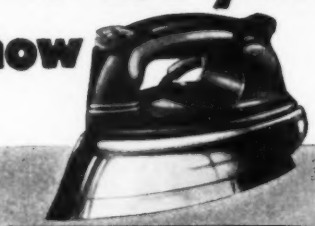
No. 16 in a series on Plastics Skill at Work...

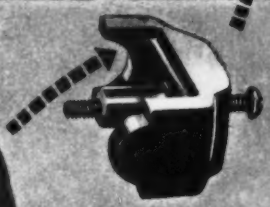
PROJECT
Handle for Arvin DeLuxe Electric Iron

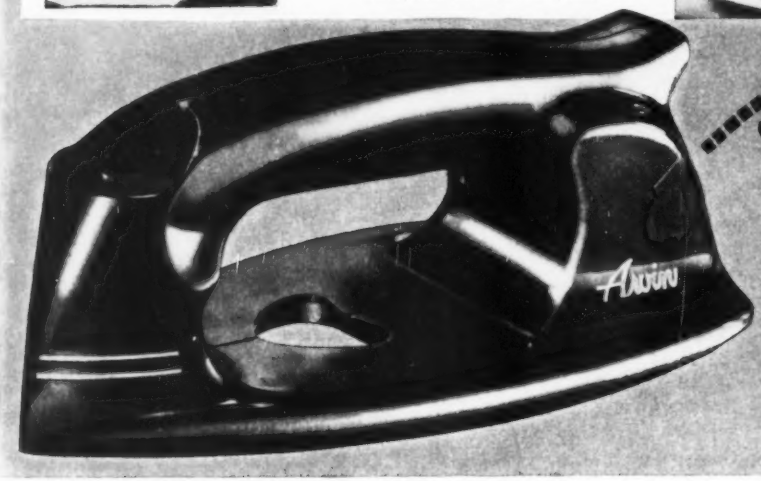
CUSTOMER
Noblitt-Sparks Industries, Inc., Columbus, Indiana

MOLDER
Plastics Research Products Co., Urbana, Ohio

MATERIAL
Durez general-purpose phenolic plastic







CORD-RETAINER INSERT is quickly reversible to make same iron "right-" or "left-handed." The 1-piece main body of handle, originally planned as a 2-piece unit, is molded in same mold as the insert. Customer saved almost 50% on mold costs formerly estimated.

● Suppose you had designed an iron to gladden any ironer's heart, only to find that the plastic handle would have to be made in two halves to retain all its selling points and hence would cost too much.

What to do? Using successful past experience as a guide, Noblitt-Sparks engineers conferred with their custom molders.

Drawing on a solid background of plastics and molding techniques, these molders helped to work out a new one-piece Durez handle with the desired heart-shaped indicator window, thermostat knob recess, undercut engraving, and a separate cord retainer that converts the iron for right- or left-hand use in an instant. This new handle eliminated the costly operation of assembling two component halves with screws and inserts. The high natural finish of the Durez phenolic makes buffing unnecessary. Flash is removed by an undercutting profile fixture, thus providing a smooth, comfortable, and decorative solution to an otherwise costly hand cleaning problem.

Not every manufacturer can use his molder's know-how to reduce the number of molded parts *and their cost* by as much as a third, as this one did. Yet good custom molders can supply good ideas as well as good moldings.

Like Plastics Research Products, your molder knows how to use the excellent properties of Durez plastics to your best advantage. Call freely on him — and on us.

A bit with plastics users everywhere is the handy "Durez Check-Chart." Write for yours. Durez Plastics & Chemicals, Inc., 124 Walck Rd., N. Tonawanda, N. Y.

DUREZ

PHENOLIC RESINS

- MOLDING COMPOUNDS
- INDUSTRIAL RESINS
- PROTECTIVE COATING RESINS

PHENOLIC PLASTICS THAT FIT THE JOB

Catalin Styrene

Packaging Medium Extraordinary!

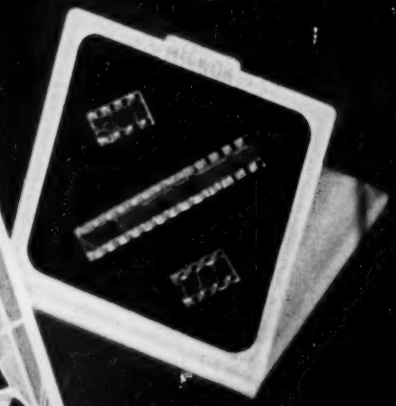
This silent sales*force*...designed and produced by Braun-Crystal Mfg. Co. of Middle Village, N. Y., clearly demonstrates the ever-widening range of creative packaging possibilities open to quality products—thru plastics — via inexpensive *Catalin Styrene* molding compounds.

Products packaged in Catalin are impressively enhanced. As gift ensembles, they bespeak the finest! To manufacturers who dare to be different, *Catalin Styrene* is a sales-stimulating medium!

We suggest you consult an experienced molder. Take advantage of his packaging ingenuity. And—when plans reach the blueprint stage—call on *Catalin Styrene's* technical staff for *material* assistance!

CATALIN CORPORATION OF AMERICA

ONE PARK AVENUE, NEW YORK 16, N. Y.



MODERN PLASTICS*

VOLUME 27 APRIL 1950 NUMBER 8

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News of the Industry; Predictions and Interpretations; Company News; Personal; Meetings

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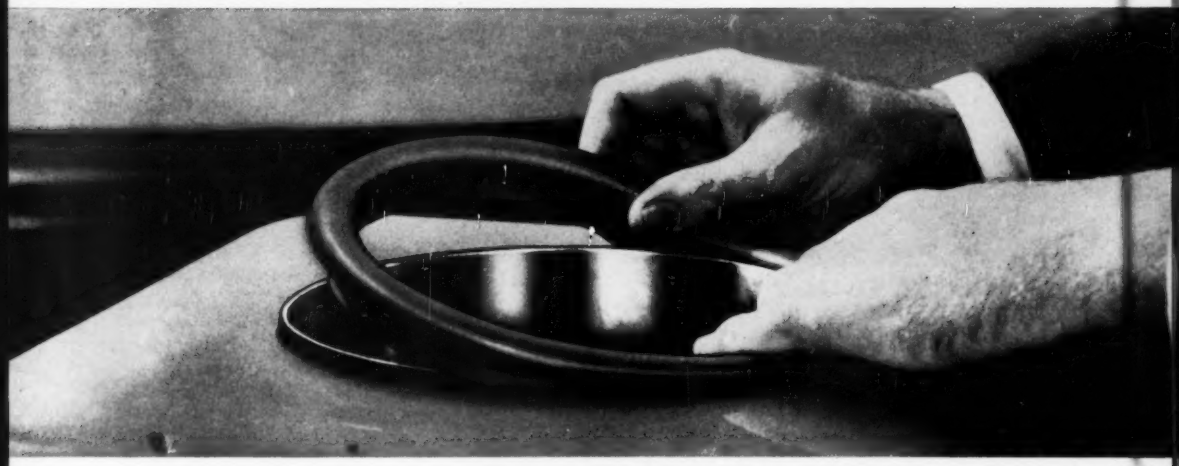
*Reg. U. S. Pat. Office

Added attraction at the water hole



Oasis Water Coolers made by Ebco Manufacturing Co., Columbus, Ohio

IN the bottle-type water cooler, you need a gasket to act as a seal between the bottle and the cabinet. Rubber did an acceptable job for many years, but there were problems . . . although the gasket never touches the water, a rubbery taste and odor were transmitted through the air.

To one of the leading manufacturers of electric water coolers, this complaint needed attention. The answer was a new extruded heat sealed gasket made from Geon plastic.

The new gasket has proved to be just what was needed. No odor or taste is transferred to make the water unpalatable. The gasket is impervious to oils, mildew, acids or gases. It keeps its shape and pliability under all conditions of temperature. It is non-fraying, and can be wiped clean with a damp cloth.

Other advantages of Geon polyvinyl materials are resistance to aging, weather and wear. Colors can be brilliant or delicate—and Geon can be extruded, compression or injection molded, calendered, or used as a coating.

Geon's versatility may point the way to improving or developing a product for you—sending more sales your way! We make no finished products—raw materials only. But we'll gladly help you with technical bulletins and helpful service. Write today. Address Dept. GA-4, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

See the newest Geon materials on display. Booth 130, 4th Nat'l. Plastics Exposition, Navy Pier, Chicago, Illinois, March 28-31, 1950.

B. F. Goodrich Chemical Company

A DIVISION OF THE B. F. GOODRICH COMPANY

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers

17 parts . . . *all Chicago Molded Plastics*

It's radically different in appearance . . . more compact and easier to handle . . . with a shaving head twice the usual width. It's the new Sunbeam Model W Shavemaster, providing faster, smoother, more comfortable shaving than ever before.

Not only its striking beauty, but also much of its amazing efficiency is due to the use of Chicago Molded Plastics. A total of 17 molded plastics parts are used in 13 applications, requiring two different molding methods and four different plastic molding materials.

* * * *

In planning the new Sunbeam Shavemaster, experimentation showed that injection molded Forticel was best for the case and cord reel. Only injection molded nylon would meet the strict requirements of the fast moving connecting rod and the three piece connector assembly. The two motor end blocks called for plunger molded improved impact Bakelite while the motor housings and coil bobbins required flame resistant acetate.

Having available complete facilities for compression injection and plunger molding of all plastics materials, Chicago Molded engineers were not limited or biased in their recommendations. They were able to utilize the materials and methods best suited to the end result demanded of each of the 17 parts. At the same time, maximum production economies are assured.

That's what we mean by Chicago Molded complete service . . . engineering, mold-making, molding . . . the correct method and material . . . plus undivided responsibility for the entire job. It's the kind of service that has caused hundreds of industrial leaders to designate Chicago Molded as their primary source of supply for the best in molded plastics. And you'll find it a mighty good reason for discussing your next job with a Chicago Molded engineer. Just write or phone . . . there's no obligation.

CHICAGO MOLDED PRODUCTS CORPORATION

1046 N. Kolmar Ave., Chicago 51, Ill.

Representatives in principal industrial centers

COMPRESSION, INJECTION AND PLUNGER MOLDING OF ALL PLASTIC MATERIALS

EDITORIAL

"NOT PLASTIC" In Ads Is NOT SMART

CONSIDERING how much television owes to plastics, we feel that newspaper ads and radio commercials featuring "wood—*not plastic!*—cabinets" are evidence of downright ingratitude.

Every television installation involves the use of at least 20 ft. of coaxial cable, and a senior version of that cable links the broadcasting stations. Without polyethylene, the television industry would not have modern coaxial cable; without the cable, video would be a scarce and unprofitable luxury.

Knobs, buttons, dials, tube bases, coil forms, insulation, screens, and masks in any good television set involve the use of vinyls, cellulosics, phenolics, styrenes, acrylics, melamine, and laminates. Without plastics—no television! It is interesting to note that as video tubes get larger, and as higher voltages are used, more plastics in television sets are mandatory because only plastics will stand up to the job!

Considering that every "genuine" mahogany, oak, walnut or blonde maple cabinet made—*not plastic!*—is good for a long life only because it is put together with plastics resin adhesives and generally finished with resin coatings, we feel that such advertising copy is downright misleading.

Without plastics adhesives, the costs of making those wood cabinets as durable and beautiful as they are would be doubled or tripled. Without plastics they would take much longer to make, would involve the use of more labor.

Considering the merchandising economy of these days, we feel that "wood—*not plastic!*" television cabinet advertising is not only ungracious and misleading: it is downright stupid—*not wise.*

If a video set is a complicated and clever electronic instrument of entertainment, then its plastics content is assurance to the buyer that it is properly designed and built for good service, safety, and a minimum of maintenance cost.

If a video set in a plastic cabinet is a noble piece of furniture, then its cabinet, screen, knobs, and mask are in tune with the modern trend in furnishings toward permanent, abuse-resisting beauty plus cleaning ease.

If a video set is purchased on the basis of dollar value (and what isn't today?), then a plastic cabinet is a sales asset. It costs less than a wood cabinet, so the buyer gets more video for the same money.

As to pure beauty: that is a matter of design. There are beautiful and ugly wood cabinets and beautiful and ugly plastic cabinets. But the beautiful plastic cabinets, with little care, remain as beautiful as when first made, while the beautiful wood cabinets require care to keep them beautiful.

Let the copywriters on ads featuring television sets get this little lesson through their heads: plastics in a television set, be they in components or cabinets, are something to point out with pride. By featuring plastics positively, the advertising copy will sell more television sets because the facts are all in favor of plastics.

Let anyone selling a thing made of non-plastic materials be advised: today, the surest way to discount yourself and your product is to stress the fact that is—*not plastic!*

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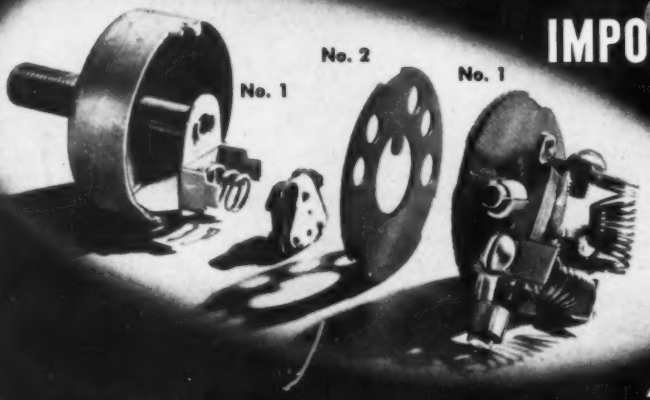
LAMINATED INSUROK BY RICHARDSON . . .

DOES 3 IMPORTANT JOBS



. . . on a five way switch for Nash

In making a five way switch for the famous Nash Weather Eye Conditioned Air System, the Douglas Manufacturing Division, Bronson, Mich., needed three parts made of plastic insulation material that embodied a variety of characteristics. Richardson's Laminated INSUROK, in two different grades, was the answer.

One paper-base grade of Laminated INSUROK met all requirements for two of the parts because of its low moisture absorption, high strength, rigidity, dielectric strength, ease of fabrication and low cost. Another grade, with a fabric base, met special requirements for physical strength for the third part.

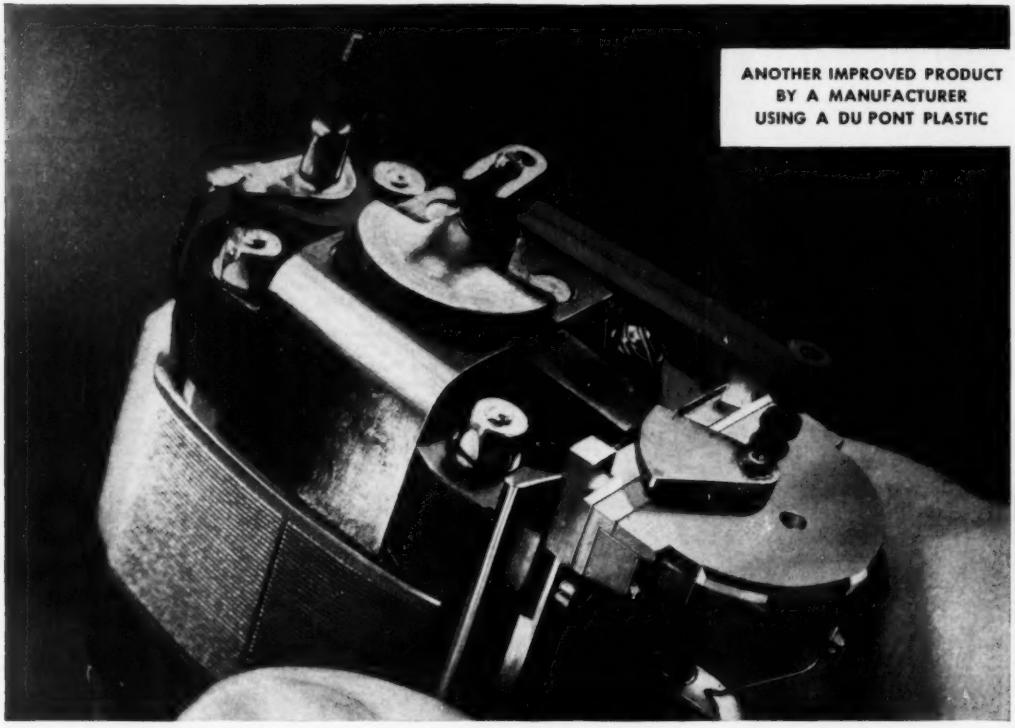
Two grades of INSUROK, in combination with metal components, resulted in a five way switch that will operate smoothly over long years of trouble-free use.

Perhaps Richardson's diverse materials of either Molded or Laminated plastic, standard or special, can solve a manufacturing problem for you.

INSUROK *by* RICHARDSON
Dependable names in plastics
INSUROK = Registered Trade Mark

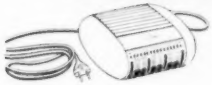
The RICHARDSON COMPANY
GENERAL OFFICES: LOCKLAND, OHIO FOUNDED IN 1858
Sales Headquarters: MELROSE PARK, ILLINOIS
2789 LAKE STREET

CLEVELAND • DETROIT • INDIANAPOLIS • MILWAUKEE • NEW BRUNSWICK, (N.J.) • NEW YORK • PHILADELPHIA • ROCHESTER • ST. LOUIS



ANOTHER IMPROVED PRODUCT BY A MANUFACTURER USING A DU PONT PLASTIC

NYLON PLASTIC DRIVES NEW ELECTRIC SHAVER



Connecting rod and three other parts of molded Du Pont nylon improve shaver operation . . . minimize need for lubrication

IN DESIGNING their new electric shaver, the Sunbeam Corporation sought the best possible material from which to produce the connecting rod used to transmit power from the motor to the cutter blade. This part has to reciprocate at speeds from 15,000 to 17,000 half-cycles per minute. It has to prevent transmission of shock from the cutter blade to the motor shaft. It has to be light enough to keep vibration at a minimum. And it has to give long, trouble-free service.

After testing essentially every material that had any possibility of meeting these requirements, Sunbeam selected Du Pont nylon plastic. Weighing only one-eighth as much as metal, nylon provides the necessary strength, toughness, resiliency. It absorbs vibration and shock. And, cored with a 1/16" hole packed with a small amount of grease, the nylon connecting rod is ready for ten years or more of perfect operation without further lubrication.

Three other parts of molded nylon are used in the new Sunbeam shaver. All play their part in speeding production, lightening weight and improving shaver performance.

Look into molded nylon parts for improving your product and its production. Nylon offers cost savings over other materials in many cases because of rapid, mass-production injection-molding, lightness of weight (which makes it cheaper than metals on a volume basis), and superior performance. In moving parts, nylon provides quiet operation either with no lubrication or with less than that required by other materials. Write for the facts today. We'll gladly suggest suppliers of molded nylon parts . . . gladly work with you in developing nylon parts to fit your needs.

E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Dept., Plastics Sales Offices: 350 Fifth Ave., N. Y. 1, N. Y.; 7 S. Dearborn St., Chicago 3, Ill.; 845 E. 60th St., Los Angeles 1, Calif.

Nylon parts for Sunbeam Model W Shavemaster by Chicago Molded Products Corp., 1024 N. Kolmar Avenue, Chicago 51, Ill.

Tune in Du Pont "Cavalcade of America"—Tuesday evenings—NBC—coast to coast.

DU PONT
REG. U. S. PAT. OFF.
Plastics
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

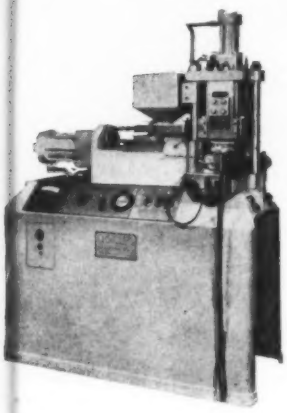
Injection molding done more profitably

WITH A MOSLO *Minijector* MOLDING MACHINE

Plastic molders and manufacturers using plastic parts will find a Moslo Minijector Molding Machine a profitable investment. Not only is the initial purchase cost reasonable, but also the efficiency of a Minijector will result in increased production at lower costs. Check these outstanding features of a Minijector, and if you are molding in plastics—invest for the future—investigate a Moslo Minijector.

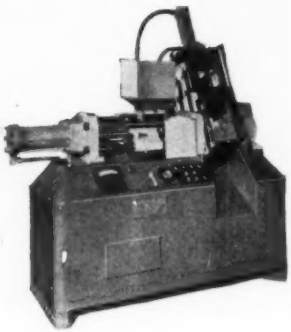
Compare *OUR* Specifications — *Guaranteed Production Ratings*

- Manually or completely automatic operation.
- Stainless steel, torpedoless cylinder, Patents Pending.
- Push button controls.
- Will mold all thermoplastics including vinyls and Nylon.
- Constructed of finest materials.
- Quick mold changing.
- Simple maintenance.
- Positive clamp.
- Greater versatility.
- Fast, even plasticizing.



← MOSLO DUPLIMATIC MINIJECTOR

- Especially suitable for high speed production of molded cord plugs, switch parts, etc.
- Designed for molding inserts with continuous action production.
- Employs a two-sided, self positioning lower mold section.
- Single operator handles loading, cycling, and unloading.
- Available in 2 oz., 3 oz., or 4 oz. injection capacity.
- All hydraulic.
- Complete operator safety.
- Automatic operation.
- Mold casting area 20 to 40 sq. inches.
- Injection pressure—16,250 to 20,000 p.s.i.

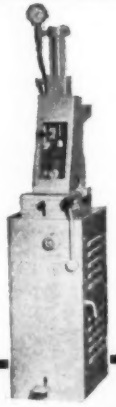


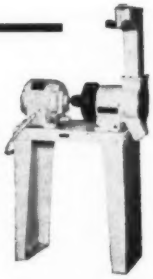
MOSLO UNIVERSAL MINIJECTOR →

- Available in 2 oz., 3 oz., or 4 oz. injection capacity.
- All hydraulic.
- Manual or completely automatic operation.
- Universal mold clamp assembly.
- Mold casting area—30 to 60 inches.
- Injection pressure—16,250 to 20,000 p.s.i.

MOSLO ¾ oz. MINIJECTOR

- Available either hydraulic or hand operated.
- Ideal for manufacturers producing small articles, research laboratories, and schools.
- Has demountable, interchangeable cylinder and heater unit permitting change of materials and color in only *three* minutes.





MOSLO NO. 60 PLASTIC GRANULATOR

- Granulates all thermoplastics.
- Delivers maximum cutting efficiency at 60 pounds per hour (Styrene).
- Cutting blades adjustable and removable for sharpening.
- Easily cleaned.
- Sealed ball bearings.

We invite your inquiry. Write today for complete information on the Moslo Minijector line and No. 60 Plastic Granulator.

SEE OUR COMPLETE LINE AT THE 1950 NATIONAL PLASTICS EXPOSITION, BOOTH #144

MOSLO MACHINERY COMPANY
2443 Prospect Avenue
Cleveland 15, Ohio

These...

were Expensive Toys

at any price

AVOID THEM WITH LUMARITH* (ACETATE) PLASTIC

SHATTERPROOF... DURABLE... SAFE

Experience proves that the wrong plastic can be the most expensive in the long run regardless of the buying price. That's why the trend to durable, shatterproof acetate continues to hold, and why store buyers welcome the toy made of Lumarith—Celanese* acetate.

THE RIGHT PLASTIC COSTS NO MORE

Lumarith is now priced the lowest in its history. In addition Lumarith virtually eliminates costly breakage in shipment, counter damage, customer dissatisfaction and factory rejects. Take all these into account and you'll understand why Lumarith is the real *economy* plastic—even for toys in the 5¢ and 10¢ bracket. Celanese Corporation of America, Plastics Division, Dept. 1-D, 180 Madison Avenue, New York 16, N.Y.

Celanese* PLASTICS

*Reg. U.S. Pat. Off.

NATIONAL PLASTICS EXPOSITION MARCH 28th-31st, NAVY PIER, CHICAGO — CELANESE BOOTH 252.

"DUTCH BOY"

STABILIZERS

for

VINYL RESINS

(Vinyl Chloride Polymers and Copolymers)

Specifically designed to give your vinyl plastics maximum protection against *heat* and *light* aging.

Our technical staff will be glad to help solve your special problems. Write us for complete information.

ADVANTAGES

- Maximum reactive lead content
- Tailored for specific needs
- Widely compatible with other compounding ingredients
- Economical
- Uniform quality

This chart describes some of our products and their uses

TRADE NAME	CHEMICAL COMPOSITION	RECOMMENDED FOR USE IN	USE DATA
"Dutch Boy" Tribase	Tri-basic Lead Sulphate	Electrical compounds	Generally used in combination with DS-207. Works best with organic ester type plasticizers.
"Dutch Boy" Tribase E	Basic Lead Silicate Sulphate Complex	Insulated wire	Lowest volume cost stabilizer especially recommended for electrical compounds.
"Dutch Boy" DS-207	Di-basic Lead Stearate	Sheeting, extrusion and molded compounds, i.e. insulated wire and vinyl phonograph records	Generally used with Plumb-O-Sil B and Tribase. Good for electricals. Adds lubricity and stabilization. Excellent alone as stabilizer and lubricant for rigid vinyl moldings.
"Dutch Boy" Plumb-O-Sil A	Co-precipitate of Lead Orthosilicate and Silica Gel	Sheeting and upholstery stocks	Easy processing. Gives a high degree of translucence.
"Dutch Boy" Plumb-O-Sil B	Co-precipitate of Lead Orthosilicate and Silica Gel	Translucent film and sheeting, belting	For translucent compounds and bright colors, minimizes spewing.
"Dutch Boy" Plumb-O-Sil B Electrical Grade	Co-precipitate of Lead Orthosilicate and Silica Gel	Insulated wire	Low volume cost, excellent electrical characteristics.
"Dutch Boy" Dythal	Di-basic Lead Phthalate	Electrical stocks and opaque films	General purpose stabilizer for heat and light.
"Dutch Boy" Dyphos	Di-basic Lead Phosphite	All opaque stocks including Plastisols and Organosols	Excellent for heat and light with organic ester and polymeric type plasticizers; anti-oxidant stabilizer; useful with chlorinated paraffin extenders. Generally used with DS-207.
"Dutch Boy" Normasal	Normal Lead Salicylate	Vinyl flooring compounds. Rubber stocks as non-scorch activator	Useful in small amounts with phosphate type plasticizer. Antioxidant stabilizer.

"Dutch Boy" CHEMICALS

NATIONAL LEAD COMPANY, 111 Broadway, New York 6, N. Y.

The Better the MACHINE . . . The Better the PRODUCT!

Successful molding of metallic polystyrene requires perfect coordination between the molder and machine in order to eliminate flow lines and sink marks in the final product.

It's no wonder that Alladin Plastics of Los Angeles, Calif., the most extensive users of this new metallic material, use Reed-Prentice machines exclusively—

Alladin is producing beautiful "Copperware" Ballerina Salad Sets and Party-Pak Sets on their seven 10D-8 oz. machines, and their manager declares, "We are very well pleased with the production and service of these machines".

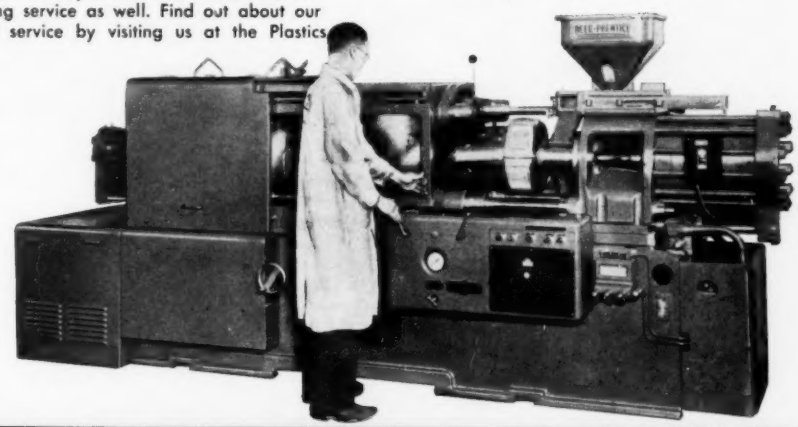
Yes, Reed-Prentice not only builds better machines, but offers outstanding service as well. Find out about our equipment and service by visiting us at the Plastics Exposition.

NATIONAL PLASTICS EXPOSITION

SPE 1950

BOOTHS 203-204

MARCH 28-31



THE WORLD'S LARGEST MANUFACTURERS OF INJECTION MOLDING MACHINES

REPRESENTATIVES

Chicago	Neff Kohlbusch & Bissell, Inc.
Detroit	Kardenbrock Machinery Co.
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Grand Rapids	Joseph Monahan
Milwaukee	Neff Kohlbusch & Bissell, Inc.
Syracuse	J. F. Owens Machinery Company
Houston	Preston Machine Tool Sales Co.
Seattle & Spokane	Star Machinery Company
Minneapolis	Chas. W. Stone Company
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INJECTION MACHINES

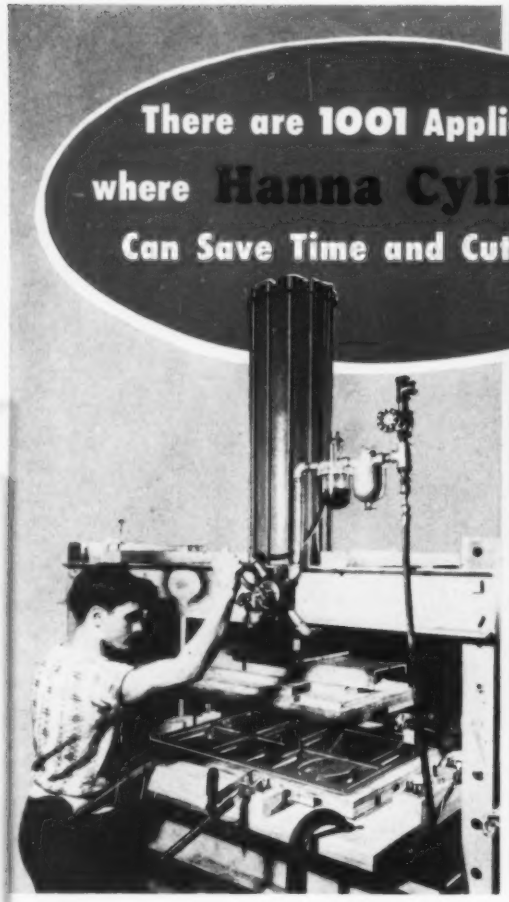
REED-PRENTICE CORP.

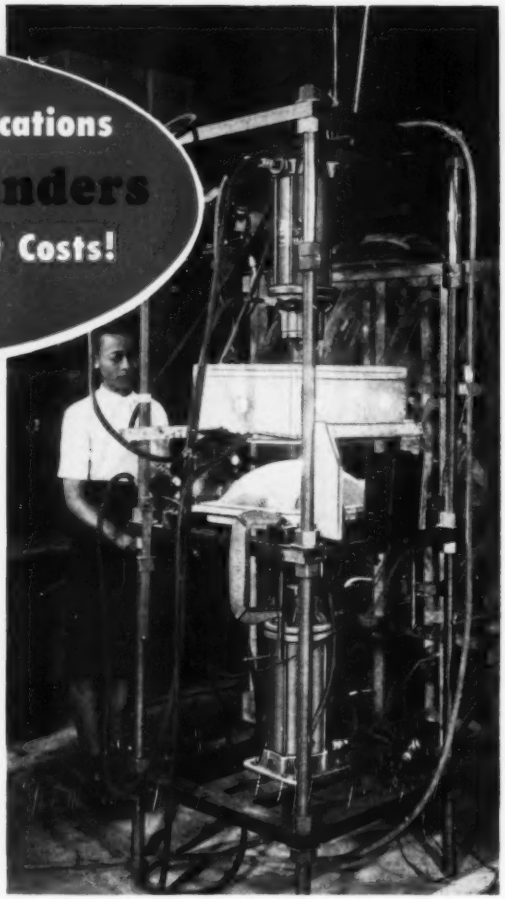
WORCESTER MASS., U.S.A.

MAIN OFFICE:
Worcester 4, Massachusetts

BRANCH OFFICES:
New York 6, New York
Cleveland 13, Ohio
Los Angeles 58, California

There are 1001 Applications where Hanna Cylinders Can Save Time and Cut Costs!





The young man (above) is taking advantage of the smooth, dependable power of a Hanna Low Pressure Cylinder to form acrylic sheets — At right, Hanna Cylinders are used with this special press to fabricate television magnifying lenses.

Manufacturers, molders, laminators and fabricators of plastic products are learning the advantages of Hanna Cylinders for both standard and special equipment. For short runs, for samples, for specialty work and for hundreds of other uses where a controlled push, pull, lift press or clamp is needed, Hanna Cylinder Power is economical, efficient, ideal for the purpose.

There are standard model Hanna Cylinders for nearly all mounting requirements . . . for a wide range of pressures . . . for pneumatic or hydraulic operation . . . to provide smooth, dependable power . . . to simplify the actuation and control of thousands of machines and equipment.

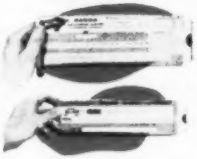
SEND FOR ENGINEERING AIDS

CATALOGS

Hanna Hydraulic Cylinders
(Catalog 233)
Hanna Low Pressure Cylinders
(Catalog 236)
Hanna Precision Valves
(Catalog 251)

CALCULATORS

Get these handy "slide rules" of cylinder information. Two Hanna calculators, one to help with Hydraulic Cylinder selection and one for Pneumatic Cylinders, are available.

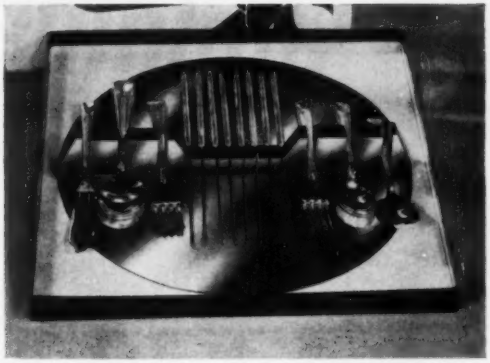


Hanna Engineering Works

HYDRAULIC AND PNEUMATIC EQUIPMENT . . . CYLINDERS . . . VALVES . . . RIVETERS

1765 Elston Avenue, Chicago 22, Illinois

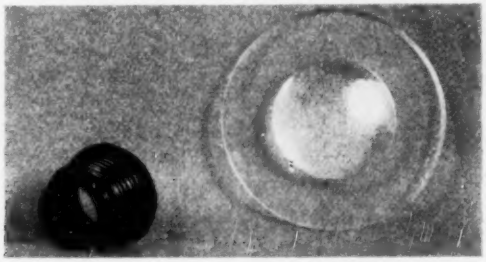
SOLVED: SALES Problems by Kirk Plastics



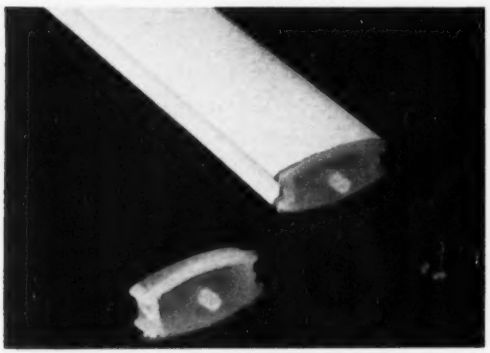
International Silver Co. needed a multi-purpose package for stainless steel, silverplated and sterling flatware. Package "core" was this one-piece platform-bridge, versatile display and home storage unit.

Increasing durability of hacksaw handle was a tough problem for Millers Falls Tool Co. Kirk solved problem by molding acetate handle direct on hacksaw frame by new process.

Competitive advantage in children's gift flatware was sought by International Silver Co. This "step-up" chest, one of a Kirk series, sparked successful 1949 campaign.



Rugged, lightweight reflector shock absorber and optically perfect magnifying lens (above) help Blake Mfg. Co. ("Ray-O-Vac") lead volume flashlight field. Just two of many precision small parts mass-produced by Kirk.



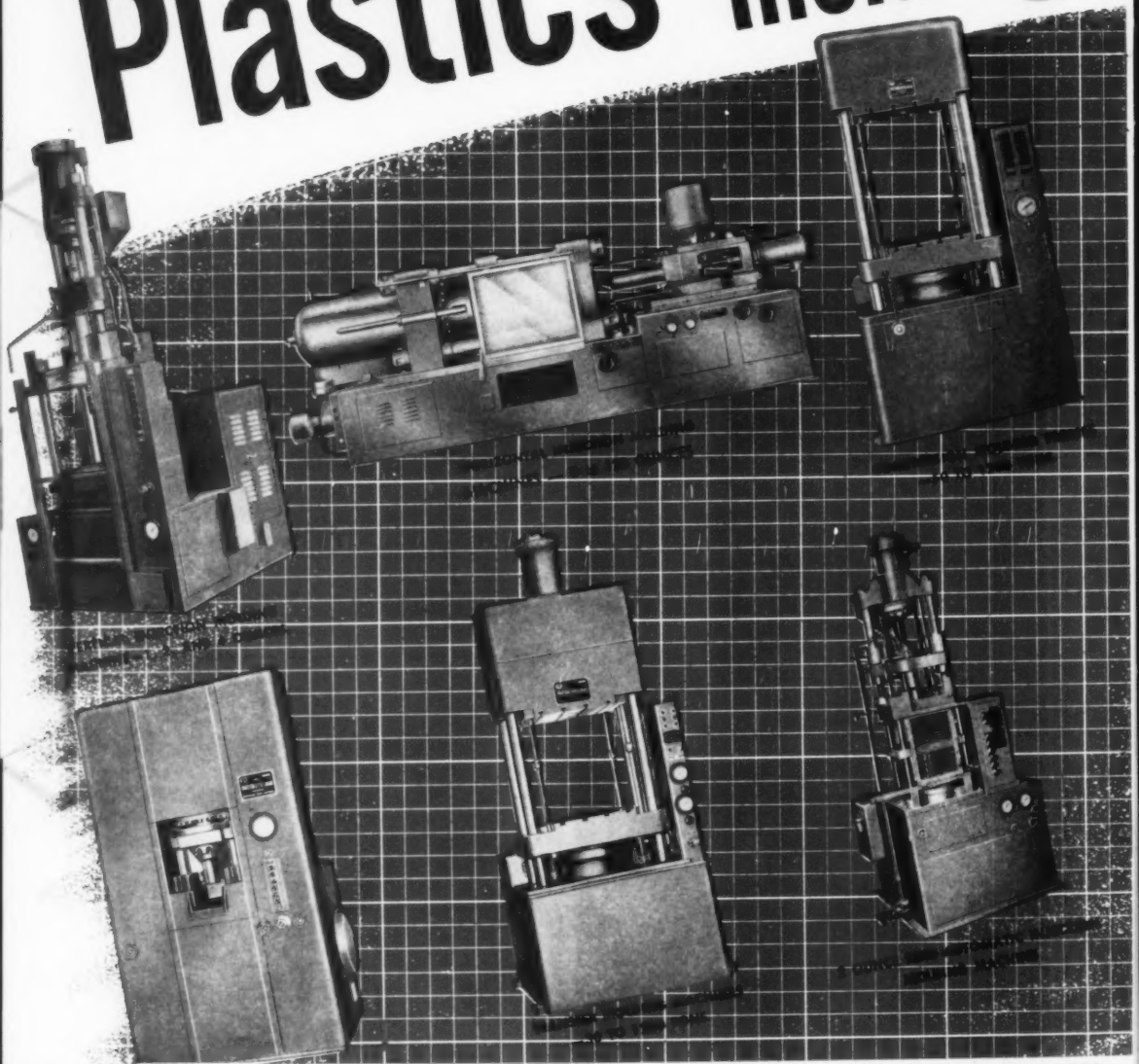
Resilient polyethylene "bumpers" in venetian blind bottom rails have projecting stud that engages hold-down bracket (not shown) in window sill, stops swaying and rattling. "Bumpers" also prevent sill and side frame damage.

The answer to your sales problem may be injection molded plastics that improve your products, improve your packaging, or both. We have proved this to the satisfaction of many seasoned businessmen. You may be interested in what our experience, methods, and facilities can mean to you. Write us about your problems, or send us sketch, blueprint and specifications for study and prompt report. No obligation.

F. J. KIRK
MOLDING CO., Inc.
CLINTON, MASS.

What is a complete line of...

Plastics molding



MANUFACTURERS OF THE MOST COMPLETE LINE OF HYDRAULIC MACHINERY

PREFORM TABLETING MACHINES
—10 AND 100 TONS

PJ-51

machinery?

50 years ago W-S put that question to the infant plastics industry... and the answers are still coming in! The gist of them is Watson-Stillman's "COMPLETELINE" of Injection, Transfer, and Compression Molding Machines . . . every model the result of collaboration with leaders in the field on their recognized problems.

This collaboration is a continuing process. Answers to latest problems are even now under test or on the boards in the products development section of our Plastics Machinery Division . . . origin of more types and sizes than any other company. For example, recent introduction of the W-S 48 oz. Injection Molding Machine provided a much needed new high in molding volume, both for single pieces and for hourly plasticizing capacity. At the other extreme of size, recent improvement of the W-S 8 oz. Machine and the new present 2 oz. W-S Semi-Automatic Vertical Machine which is operating and on display for your inspection now supplies injection molders a highly efficient production and short run unit at lower first cost.

Not all of your problems involve new equipment, however. Mold designs, material selection, operation, maintenance, plant layout, and even product markets are subjects about which W-S is in a particularly good position to give advice to its clients as a part of its "COMPLETELINE" service.

When planning plant extension or a new business, consult W-S *first* about plastics machinery and how to use it. Chances are almost certain we have the answer to "What is a Complete Line of Plastics Molding Machinery"—for *you.*

WATSON-STILLMAN

HYDRAULIC MACHINERY DIVISION Established 1848—Factory and Main Office: Roselle, New Jersey

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For the premier in luminescent plastics

use

PAULITE PHOSPHORESCENT POLYSTYRENE

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PAULITE PHOSPHORESCENT POLYVINYL

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PAULITE FLUORESCENT POLYSTYRENE

(for use with black light)

LONG LASTING LUMINESCENCE

Articles made of PAULITE emit a warm, friendly glow in the darkness. This after-glow lasts for as many as 10 or more hours, depending upon the intensity of activation.

EASY TO USE

Luminescent PAULITE comes in ⅛" to ¼" granules — ready for immediate molding. You handle PAULITE just as you would any other thermoplastic molding compound—it requires no special treatment before, during or after molding. All ingredients are thoroughly sealed, finished pieces have a glossy surface.

For complete information about the various varieties of PAULITE and how they can increase the saleability of your products write.

*Reg. U. S. Pat. Off.

THE PREMIERE IN LUMINESCENT PLASTICS
PAULITE
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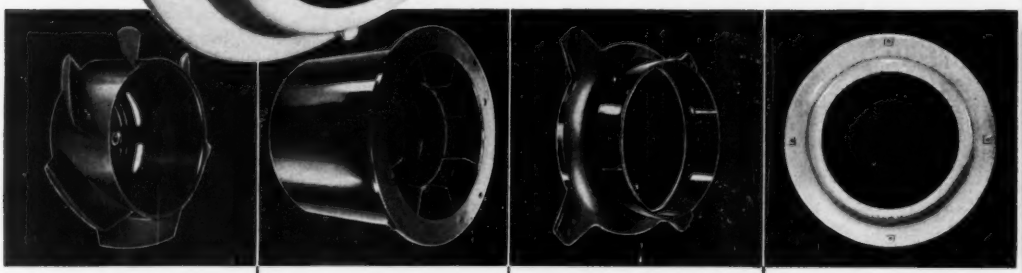
LUMINESCENT PLASTICS CORP.

201 NORTH WELLS STREET • CHICAGO 6, ILLINOIS

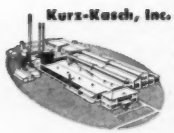
Axivane Kitchen Exhaust Fan—by Joy Mfg. Co.

A Whiz-z-z-z in PLASTICS



one | **two** | **three** | **four**

PERFORMANCE-WISE—in a class by itself! Production-wise — an almost classic plastics application! This Joy Axivane Kitchen Exhaust Fan has something to offer everybody. • It consists of a motor, a filter unit, a vast amount of ingenuity, and some 9 lbs. of plastics, Kurz-Kasch moulded. There's the rotor (**one**), *statically and dynamically balanced*. There's the casing (**two**) with moulded-in stationary vanes and motor mounting—*nearly 5 solid pounds of it*. There's the big plunger-moulded flared intake (**three**), engineered as a press-fit support member. They're *all* phenolic material. Then, there's the urea bezel retainer ring (**four**), 15" in diameter. Assembled, you get the only vane-axial exhaust fan on the market—quiet, non-turbulent, highly efficient and easily installed—effective not only in kitchens, but wherever volumes range from 250 cfm to 400 cfm at pressures not exceeding 0.8" w.g. • Why plastics? It's fire-resistant, acid-resistant and weather-proof. It's light for easier mounting. It's attractive cost-wise. And after months of tests, its dimensional stability has been pronounced noteworthy. • Why Kurz-Kasch? We've built our reputation on jobs like this for over well over 30 years. Jobs that we're proud of, from good design to on-time delivery. Call us and we'll do the same for you.



Kurz-Kasch, Inc. • 1415 South Broadway • Dayton 1, Ohio

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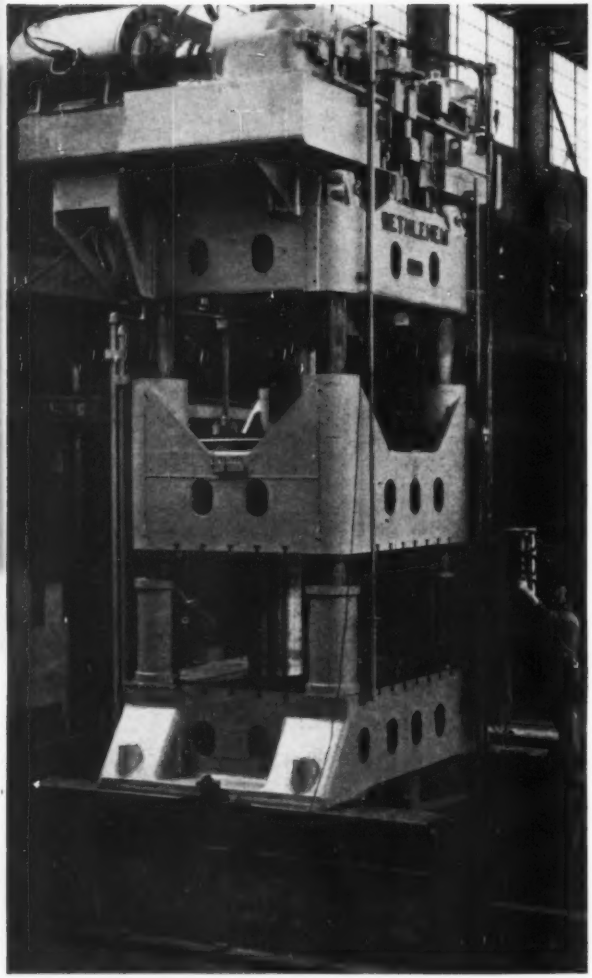
Kurz-Kasch

FOR OVER 34 YEARS PLANNERS AND MOULDERS IN PLASTICS

Bethlehem offers *everything* for the planning and building of Hydraulic Presses



When the time comes to add new presses, large or small, by all means check with Bethlehem. We offer a complete one-stop service that begins with the planning stage and carries through every step of building, equipping, and assembly.

Bethlehem hot-plate, molding, and metal-forming presses are made to order in a wide range of sizes. The one shown here, with self-contained power plant, has a capacity of 825 tons. Units of much higher or lower capacity can be built to your specifications.

Considerable latitude is possible in the choice of power equipment. When you order a Bethlehem press, you may specify built-in or separate hydraulic plant; or, if you wish, we can furnish the press alone, without power plant or accessories.

Bethlehem has the engineers, the knowledge, and the facilities needed for work of this kind. We are old hands at the business, with years of experience behind us, and we can build the press that will meet your needs exactly.

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BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
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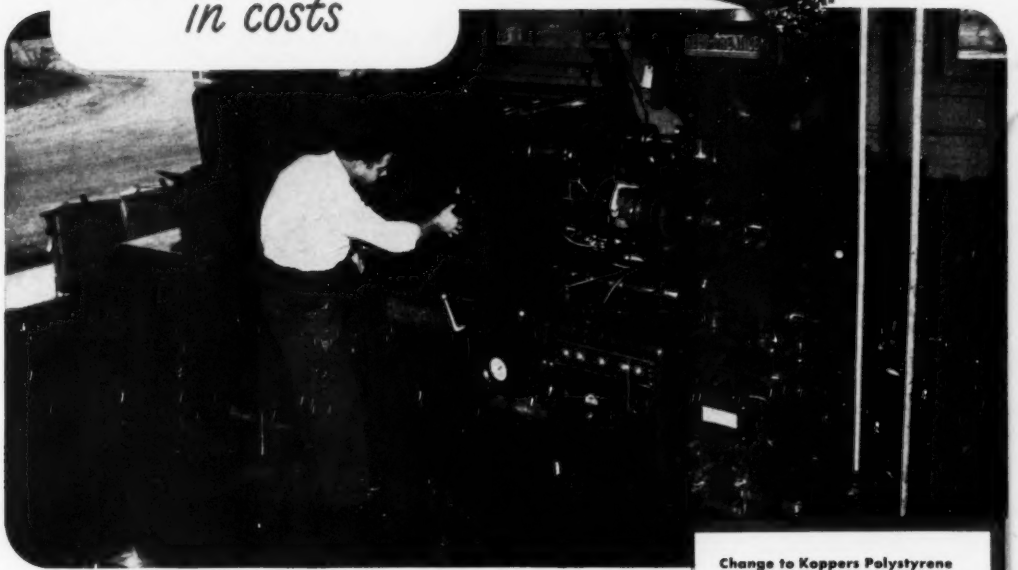
★ BETHLEHEM STEEL ★

BETHLEHEM
Custom-Built
HYDRAULIC PRESSES

FOR PLASTICS · METAL-FORMING · WALLBOARD · FIBER BOARD · VULCANIZING

Change to Koppers Polystyrene *for a* DOUBLE REDUCTION *in costs*



LOWER MATERIAL COSTS. Look at your product through the eyes of a cost accountant. Could it be made at lower cost if all or part were made of Koppers Perfected Polystyrene?

Plastics will usually cut costs over other materials . . . and Polystyrene is the lowest in cost of all thermoplastics.

LOWER MOLDING COSTS. All types of Koppers Polystyrene are now available externally lubricated to meet all of your intricate molding requirements. These types are designated as Koppers 31, 71, and 81 respectively. You will get an unusually fast molding cycle, better moldability and easy release from the mold by using any one of these three types of Koppers Polystyrene and these advantages will result in lower molding costs.

Koppers Engineering Service

Koppers staff of technical experts is thoroughly experienced in practical molding problems. These men can help you improve your molding process to obtain a better molding cycle. A call on the phone will quickly bring a Koppers "trouble shooter" to your assistance—without obligation.

KOPPERS COMPANY, INC.
Chemical Division Pittsburgh 19, Pa.
Regional offices: New York, Boston
Philadelphia, Chicago, Detroit and Los Angeles

Change to Koppers Polystyrene to improve your products and lower your costs.

SUPERIOR ADVANTAGES OF KOPPERS POLYSTYRENE

- Excellent dimensional stability
- Excellent electrical properties
- Good heat resistance—200° F. for type 8
- Good chemical and moisture resistance
- Tasteless and odorless
- Unlimited color range
- Light weight gives more pieces per pound

KOPPERS

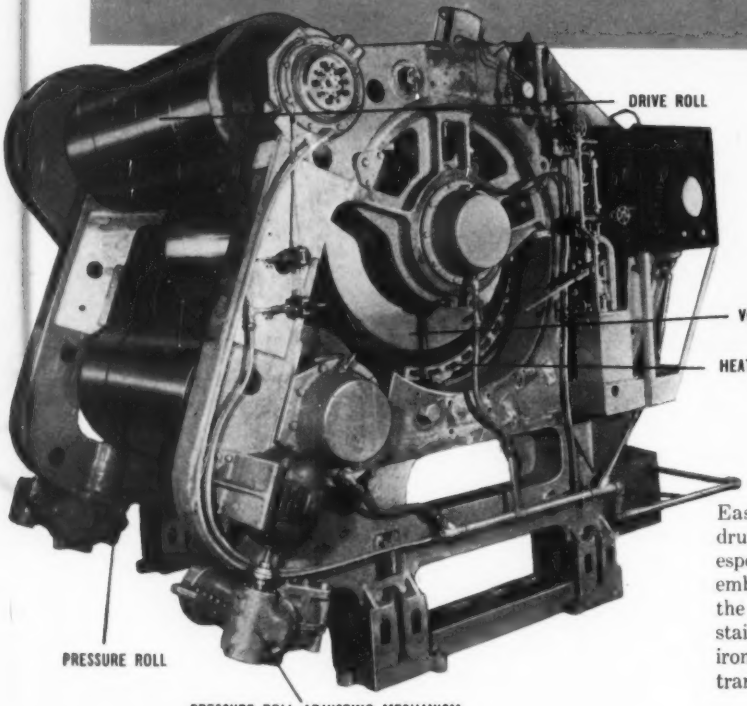
Koppers *Perfected* Plastics

A completely new and redesigned

FOR CONTINUOUS

Permits roll and belt

A NEW ROTOCURE, DESIGNED TO GREATLY FACILITATE REMOVAL OF THE VULCANIZING DRUM AND REPLACEMENT OF THE STEEL BAND, IS NOW AVAILABLE AS A RESULT OF COOPERATIVE ENGINEERING BY ADAMSON UNITED COMPANY AND BOSTON WOVEN HOSE AND RUBBER COMPANY



Easy removal of the Vulcanizing drum to make quick roll changes is especially important when use of an embossed curing roll is necessary, as in the production of floor matting and stair treads. The changing of edge irons when producing conveyor or transmission belting is also facilitated.

The pressure (gauging) roll will withstand a separating force of 250,000 pounds per adjusting screw. It is contemplated that certain stocks can be calendered and cured in a single operation, gauging being accomplished between the pressure roll and the curing roll.

ADAMSON UNITED COMPANY

AKRON 4, OHIO

SUBSIDIARY OF UNITED ENGINEERING & FOUNDRY COMPANY

BRANCH OFFICES IN PRINCIPAL CITIES

ROTOCURE*

VULCANIZATION

changes in 1/10th the time!

One piece housings provide adequate "window" clearance for removal of the curing roll. A special "C"-Hook is furnished for supporting the roll as illustrated. All design details have been engineered to facilitate and speed roll changing. For example, all supply and return lines are quick-disconnect type. The heating shoes surrounding the Vulcanizing roll are automatically retractable.

Some desirable features:

- **All rolls are supported in self-aligning roller bearings, oil flood lubricated.**
- **Speed range is adjustable from ½ to 6.2 feet per minute.**
- **Vulcanizing roll is 60" diameter; 80" face.**
- **Tension roll is hydraulically actuated; maximum belt tension, 240,000 pounds.**

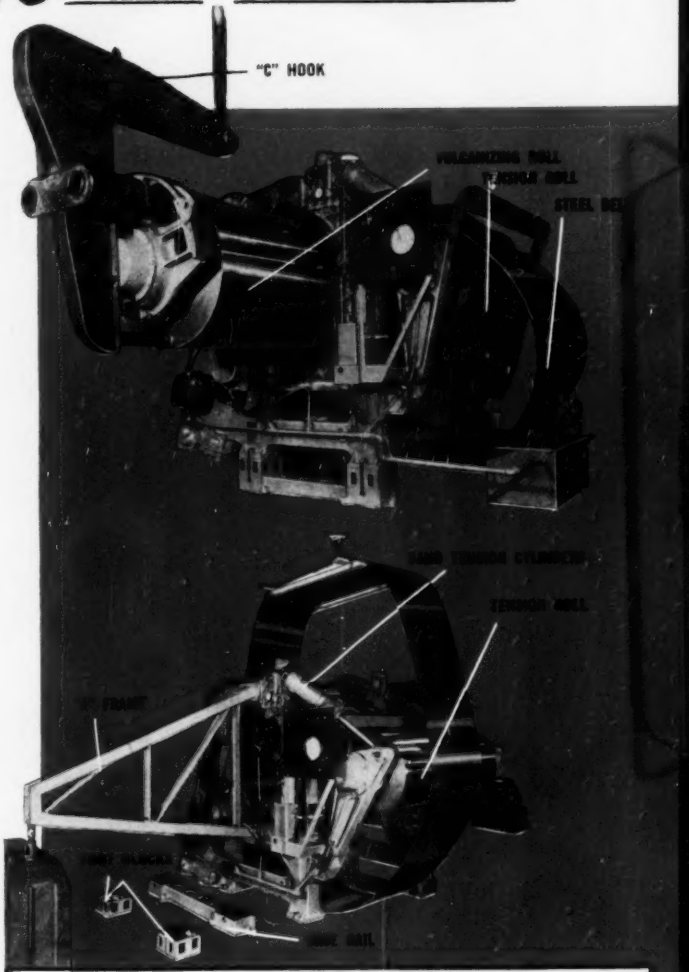
Easy replacement of the steel band is made possible by the ingenious arrangement illustrated. After the curing roll has been removed, the specially provided "A-Frame" is bolted in place and jacked up far enough to remove the weight from the base rail on the near side. The two "foot blocks" are then taken out, permitting the belt to be removed through the resulting opening.

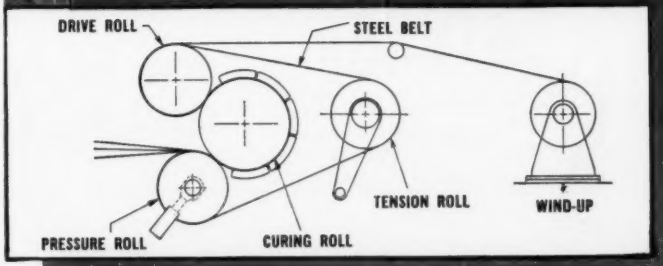
Operation of the Rotocure is shown schematically at right. The Rotocure has many advantages over the conventional press on large production runs. For example:

- **Increased production provided by continuous operation, which eliminates opening, cooling, reheating and closing.**
- **Elimination of overcuring and undercuring of the over-lap areas occurring on conventional presses.**
- **Greater uniformity of stretch.**

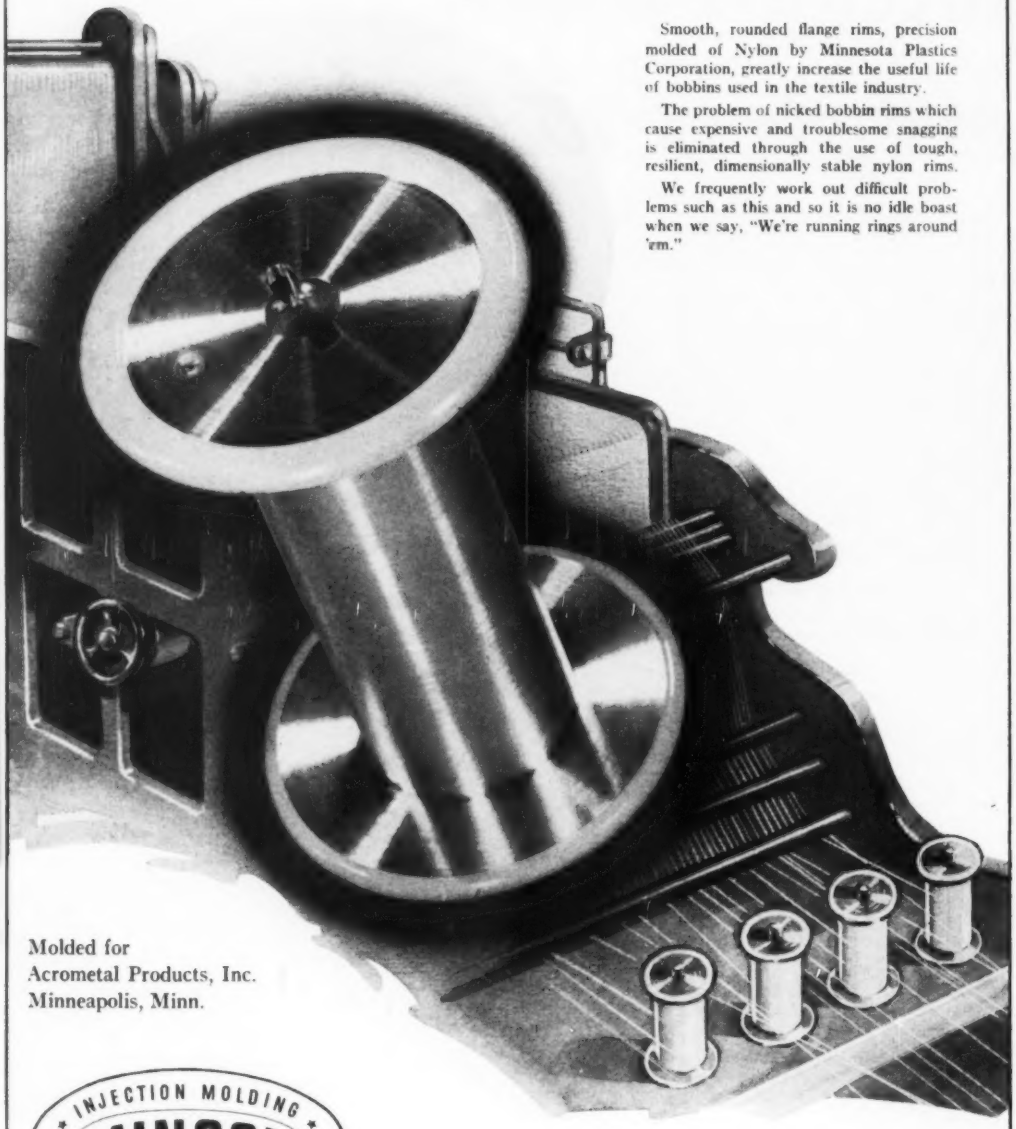
Our engineers are available for consultation concerning the possibilities of the Rotocure for your particular products.

**The Rotocure machine is a patented development of Boston Woven Hose and Rubber Company built by Adamson United Company under a licensing arrangement.*





We're Running RINGS around 'em



Smooth, rounded flange rims, precision molded of Nylon by Minnesota Plastics Corporation, greatly increase the useful life of bobbins used in the textile industry.

The problem of nicked bobbin rims which cause expensive and troublesome snagging is eliminated through the use of tough, resilient, dimensionally stable nylon rims.

We frequently work out difficult problems such as this and so it is no idle boast when we say, "We're running rings around 'em."

Molded for
Acrometal Products, Inc.
Minneapolis, Minn.

INJECTION MOLDING
MINCOR
"YOUR PLASTICS DEPARTMENT"

MINNESOTA PLASTICS CORP.

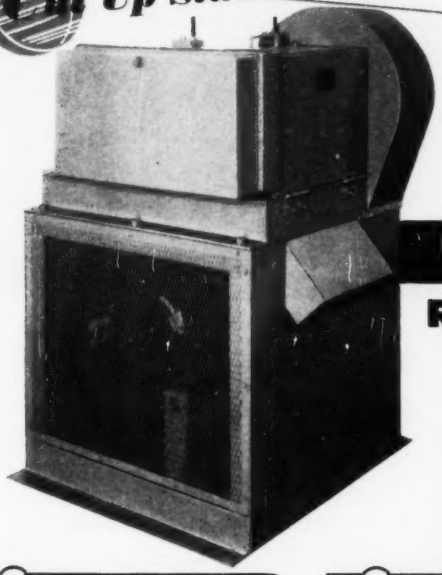
366 WACOUTA • ST. PAUL 1, MINN.

Cut Slabs From Compounding Mills!

Produce Pellets For Molding Material!

Cut Up Continuously Extruded Scrap!

Cut Up Side Shear or Rejected Sheet Material!



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Rotary Chopping Machine

Every day more and more time and money saving uses are being found for this versatile machine.

Bulletin 400 gives full information. It will probably suggest a use for your plant.

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PLASTICS GRANULATING MACHINES

Models 0, ½, 1½

Small and medium capacity. Designed specifically for plastics. Rugged and easy to clean. Request Bulletin No. 250.

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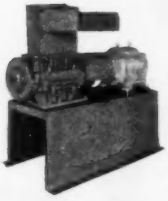

GRANULATING MACHINE

Model 18

Large capacity. Double hung construction. Easy to inspect, dismantle, and adjust. Further details are in Bulletin No. 250.

Now Available!

A NEW, SMALLER MODEL

CUMBERLAND PELLETIZING MACHINE

Designed specifically for pelletizing material from continuous extrusion machines. For complete details request Bulletin No. 500.

CUMBERLAND *Engineering Company Inc*

BUILDERS OF BETTER MACHINES FOR THE PLASTICS INDUSTRY

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PLASTICS FOR INDUSTRY

The large polystyrene casting illustrated above is used in the ADMIRAL CORPORATION'S 12-1/2 inch television console model.

The piece is molded in a 40 ounce press and is decorated in gold.

CRUVER

MANUFACTURING CO.

2460 W. JACKSON BLVD., CHICAGO 12, ILL.

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Formaldehyde Solution U.S.P. (37% by weight). A clear, colorless liquid of the highest purity. Shipped in tank cars, tank trucks, drums, carboys and bottles. Methanol-free grade also available.

PARAFORMALDEHYDE

Uniformity, purity and high assay characterize this raw material for plastics, resins, adhesives, etc. Powder, Flo Granules and Granules. Shipped in 250, 100, 50 and 25 lb. fiber drums.

HEXAMETHYLENETETRAMINE

A uniform and pure source of anhydrous formaldehyde for use in molding powders, etc. U.S.P. and Technical grades. Shipped in 200 and 150 lb. bbls.; 100, 50 and 25 lb. fiber drums.

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Also Available: **Phenyl Salicylate, Dibenzyl Ether, Pentacizers and Pentek.**

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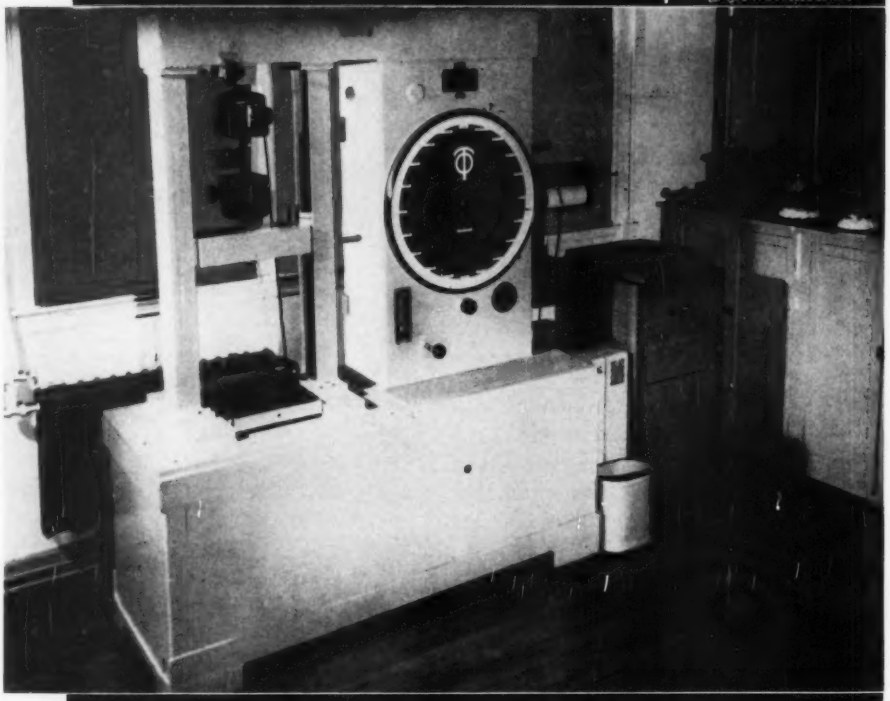
★ FOR RESEARCH
★ FOR QUALITY CONTROL
★ FOR PRODUCTION TESTING

Research tension testing. Producing stress-strain curves with Olsen Plastiversal equipped with Olsen Electronic High Magnification Recorder.



it's the

OLSEN PLASTIVERSAL

THE UNIVERSAL TESTING MACHINE FOR PLASTICS

Courtesy of National Vulcanized Fibre Co., Wilmington, Delaware

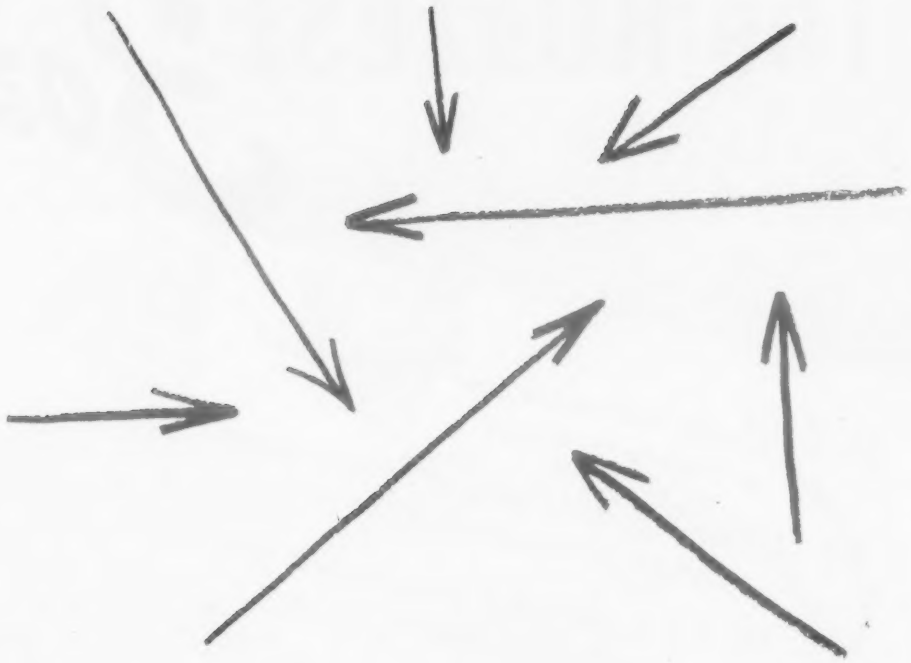
WITH the Olsen Plastiversal you are assured of dependable, economical and accurate testing of all types of plastic materials, whether these tests are run on film, sheet, plates or blocks, molded specimens or other parts. It is easy to plot stress-strain curves when the Plastiversal is equipped with the Olsen High Magnification Recorder.

The Plastiversal by its very simplicity of design—operating parts are at a minimum—will keep maintenance costs low while making test after test for comparison, standardization, control and development of plastic materials.

Write today for our NEW Bulletin #36 which includes, not alone the Plastiversal, but many other Olsen machines designed specifically for plastics.

TINIUS Φ OLSEN
Testing & Balancing Machines

TINIUS OLSEN
TESTING MACHINE CO.
2050 Easton Rd., Willow Grove, Pa.



They're all the same to a TIMKEN® bearing

NO MATTER from what direction the loads may come, Timken® roller bearings carry them all safely—dependably. Timken bearings are tapered in design—carry both radial loads, thrust loads and any combination of them.

With Timken bearings in your product, auxiliary thrust bearings and thrust plates are eliminated. Designs can be simplified, space saved, cost reduced.

You have a better-working product, too. The tapered construction of Timken bearings prevents end-play and holds shafts in proper alignment. Wear on surrounding parts is reduced; gears mesh more smoothly.

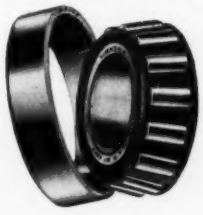
And Timken tapered roller bearings give you these added advantages: Due to the line contact between rolls and races, they have extra load carrying capacity. True rolling motion and smooth surface finish practically eliminate friction. Timken bearings permit the use of closures which keep lubricant in—dirt out. And since they're made of Timken fine alloy steel, Timken roller bearings normally last the life of the machine in which they are used.

Dependable performance and public acceptance of Timken bearings have made Timken-bearing-equipped products first choice throughout industry. They add a valuable sales feature in your product—build greater acceptance among customers. When you specify bearings for your product, specify "Timken". And when buying new equipment, always look for the trade-mark "Timken" on the bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



The HOTTEST 3 oz.

So Fast that 'cold water quenching' is a part of the new technique

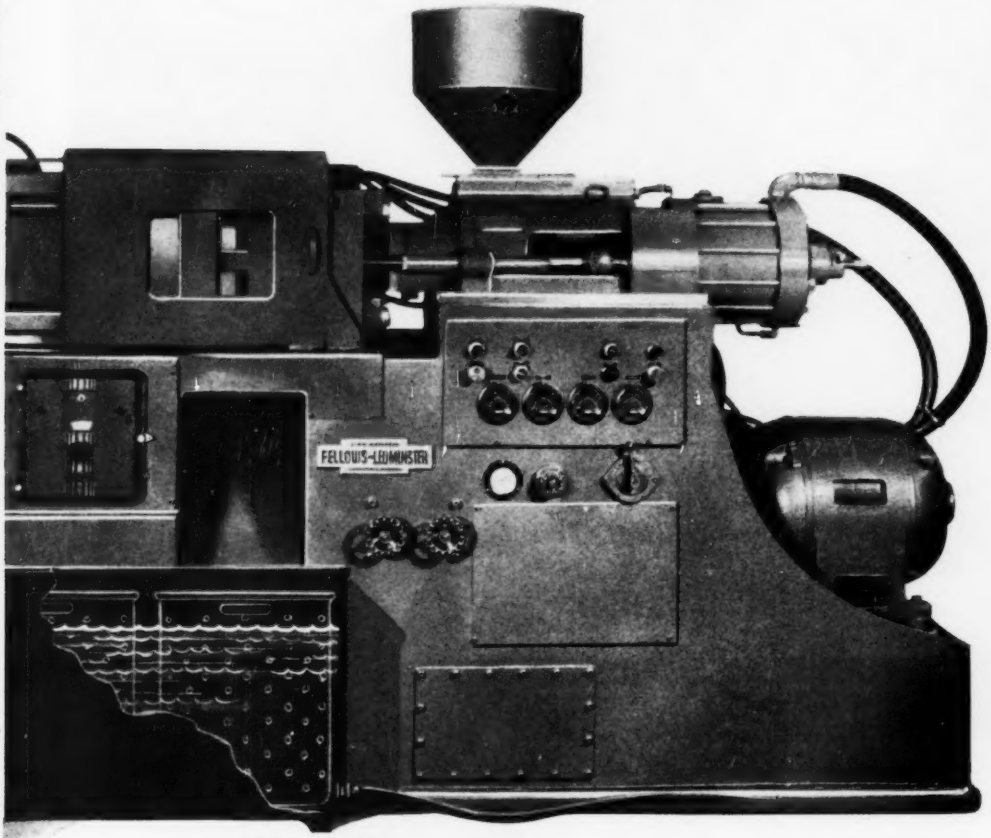
So Automatic that a group of three machines can be tended by one operator

So Ahead in design that it surpasses all other equivalent-size equipment

ENTHUSIASTIC RESPONSE to the new Fellows technique of 'HOT MOLDING' is coming from all parts of the country. Big-mold production from small, low-cost molds is the result when one of these new 3 oz. machines is installed. No wonder cost-conscious molders are so quickly turning to the economical Fellows-Leominster No. 18-3-15.

For details stop at BOOTH No. 258
NATIONAL PLASTICS EXPOSITION
Navy Pier, Chicago, March 28 to 31
or write to the nearest Fellows Office.

Molding Machine on Today's Market!



Fellows LEOMINSTER

injection molding equipment

THE FELLOWS GEAR SHAPER CO., Plastics Machine Div.: Head Office and Export Dept., Springfield, Vermont. Branch Offices: 616 Fisher Bldg., Detroit 2
640 West Town Office Bldg., Chicago 12 • 2206 Empire State Bldg., New York 1 • New England Distributor: Leominster Tool Co., Leominster, Mass

...duck soup

Your plastic molding problems are duck soup to an organization that has grown and prospered by making tough problems their business. ...duck soup to an organization that has unmatched facilities and highly trained technicians to find the *right* answer to problems in design, inexpensive mass production, molding, and packaging. ...duck soup to an organization that has long been known for its ability to bring customers unequalled SERVICE in every respect.

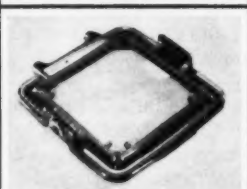
Why not put *your* plastic problems in the hands of Columbia's experts?

Columbia

COLUMBIA PROTEKTOSITE CO., INC., CARLSTADT, N. J.

N. Y. Show Rooms: Empire State Building. • West Coast Office: 380 Bayshore Blvd., San Francisco, Calif.

HOW TO CHOOSE YOUR
HEAT RESISTANT GRADE
PHENOLIC MOLDING COMPOUND

What do you make?		Properties you need	DURITE recommends
Heater plugs and similar appliance parts.		Excellent finish and resistance to heat and moisture, improved impact strength.	For general use: 533 For highest heat resistance and impact strength: 577 Black or brown.
Cooking utensil handles, electric iron handles, etc.		Lustrous finish, good heat and moisture resistance.	For improved heat resistance: 509 For good heat resistance with higher impact: 533 For general use: 560 Black or brown.
Diamond wheel cores and similar industrial applications.		Improved impact coupled with good heat resistance.	Improved impact: 577 Black. Highest heat resistance: 739 Black or brown.
Electric waffle base, toaster bases, etc.		Lustrous finish, good heat and moisture resistance.	For general use: 560 For improved heat resistance: 509 For improved heat resistance with higher impact: 533 Black or brown.
Heavy duty switches.		Good heat and moisture resistance with good impact properties.	For general use: 739 Black or brown. For improved impact: 577 Black.

For products that have to "stand the gaff", molders turn to DURITE, specialists in phenolics for General Purpose, Heat Resistance, Electrical Resistance, Impact Resistance — and made-to-order modifications of standard materials embodying special characteristics to meet your specific requirements. Address:

THE BORDEN COMPANY · CHEMICAL DIVISION
Dept. MP-40, 350 Madison Avenue
New York 17, N. Y.

DURITE
Molding Powders · Bonding Resins · Cements

THREE NEW MULTI-SCREW "RC" COMPOUNDER-EXTRUDERS

...for compounding · coloring · reclaiming scrap · extruding

HIGHER CAPACITIES! NEW DESIGNS! IMPROVED CONSTRUCTION!

All three models are completely new . . . engineered from the ground up to set new standards for compounding, for coloring, for extruding and for reclaiming scrap thermoplastic.

Each of these new machines features startling economy of operation, unusual compactness, a truly moderate initial cost and outstanding rates of production (the triple-screw RC-200, for example, can simultaneously compound, color and extrude at better than 200 pounds per hour!)

EXCLUSIVE "MULTIPLE SCREW" DESIGN

A glance at the specifications will show you how and why these new RC units can compound, plasticize and color with such spectacular efficiency . . .

All of them employ multiple screw construction. Both the RC-65 and the RC-100 have *two* interpenetrating screws, while the high capacity RC-200 has *three!* In operation, the flights, interpenetrating as they do, insure complete plasticization, thorough mixing and 100% color dispersion.

LOW POWER CONSUMPTION

The special multiple screw construction has other advantages too. Not only does this type of design permit a sharp reducion in overall barrel length, with a consequent saving in the amount of floor space needed for each machine, but it slashes power costs as well. Note that even the largest

J-C **JACKSON & CHURCH CO.**

SAGINAW, MICHIGAN

WORK WELL DONE SINCE '81

model, the triple-screw RC-200, can be operated with only a 15 HP motor.

HIGH OUTPUT

The "Average output" figures in the table deserve careful study. They represent the average hourly output for the *simultaneous* compounding, coloring, plasticizing and extruding of uncolored resins plus colorants, plus plasticizers plus fillers!

Rates are appreciably higher when these models are used for the straight extruding of pre-colored, pre-plasticized compounds.

NO FOUNDATION NEEDED

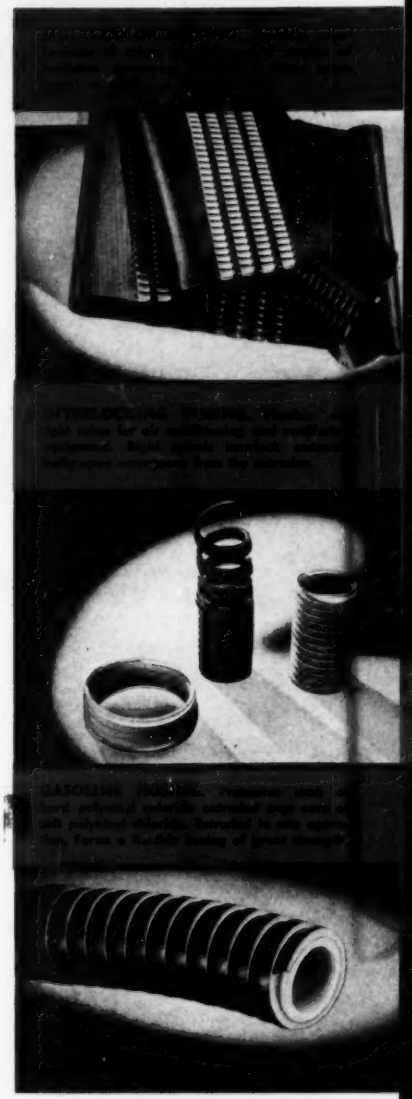
All RC models are so vibrationless, so perfectly balanced, that no special foundation or bolting to the floor is required. As a matter of fact, each unit is designed to permit easy moving from place to place. Hence, two or more units can be grouped together whenever needed to produce multi-color work or compound extrusions of two or more different materials.

GET THE DETAILS

You will certainly want to learn more about these remarkable new units: the unusual extrusions they make, their ease of operation, their compactness, their many automatic features and, best of all, their very modest cost. An inquiry mailed today will bring a detailed response in "one-two-three" order.

	RC-65	RC-100	RC-200
Number of screws	2	2	3
Diameter of screws	3.15 - 3.54	4.33	4.72
Average output	66 lb./hr.	100 lb./hr.	200 lb./hr.
Motor			
horsepower	5	7½	15
speeds	3-speed (6, 9, 12 rpm)	variable from 6-20 rpm	variable from 6-20 rpm
Shipping weight (approx.)	2185 lb.	2685 lb.	5685 lb.
Floor space			
extruder	2' 6" x 3' 6"	3' 6" x 3' 6"	5' 6" x 6' 6"
control panel	2' 3" x 2' 3"	2' 3" x 2' 3"	2' 3" x 2' 3"
Hopper Feed	Fully automatic, rotating type . . . geared to screw speeds		
Lubrication	Forced-feed to all gears and bearings		
Foundations	None required		

PRODUCTS LIKE THESE ARE EASY TO MAKE WITH "RC" MACHINES!



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MANUFACTURERS UNDER L.M.P. PATENTS
16 Finsbury Sq. London, E.C.2 England

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SAGINAW, MICHIGAN

WORK WELL DONE SINCE '81

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- TINSELS
- PHOSPHORESCENTS
- CUSTOM-MADE COLORS
- EDGELIGHTING MATERIAL

Special Colors! Special Effects! *at low, low prices!*

CREATED IN AMPACET® POLYSTYRENE

BY AMERICAN MOLDING POWDER & CHEMICAL CORP.

AMPACET PEARL—the eye-catching and alluring plastics material for jewelry boxes and containers of all kinds, for clock and instrument housings, for toys and baby items, for bathroom fixtures and wall tile, for novelties and hundreds of different uses, for brushes, toilet-ware and cosmetic articles. Economical, because it blends with crystal Polystyrene. Formulated for easy molding and good impact resistance.

PHOSPHORESCENT—for products that should glow in the dark and look well in daylight. Articles made from Ampacet Phosphorescent Polystyrene retain their beautiful finish, their warm, appealing glow.

METALLICS AND TINSELS—Unusual effects of sparkling brilliance and beauty—gold, silver, copper and bronze Polystyrene, and metallic tinsel flakes imbedded in transparent plastics material.

IRIDESCENT POLYSTYRENE (EDGELIGHTING MATERIAL)—the two-tone effect successfully employed for edge lighting in advertising display material.

COLOR *can help launch a new product dramatically*

COLOR *can put new sales appeal into an old product*

We custom color to your specifications—colors are matched accurately and kept constant time after time.

Get Out Of The Rut Of Standard Colors with low priced AMPACET Polystyrene.

(Also Manufacturers of AMPACET Cellulose Acetate Molding Powder)

ANY COLOR • • • ANY FLOW • • • AT LOWER PRICES

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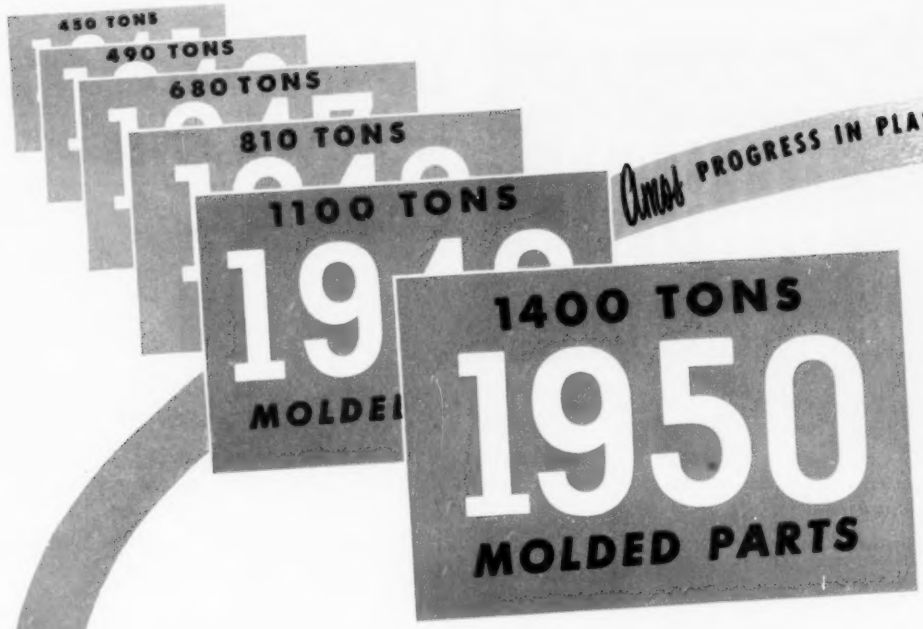
Phone: MAin 5-7450 • *Cable:* Chemprod Brooklyn



not how much but HOW WELL

▶ YES—AMOS is *in step* with the "PROGRESS IN PLASTICS"

An impressive 1949 production record is already being surpassed with the addition of LARGER equipment for molding BIGGER parts.

And the formula at AMOS continues to be *quality* combined with *quantity.*

AMOS *offers complete molding facilities* . . . with Designing—Engineering—Mold Making—Molding and Finishing all under *one* roof . . .

PLUS INGENUITY and EXPERIENCE!

See the proof at Amos Display Booth 202B. Please bring *your* plastic problems with you and discuss them with AMOS engineers.

Write for our new 52-page booklet, picturing in full color the sales and engineering ideas developed by AMOS for every industry.

SEE US AT

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Edinburg, Indiana

New York Office
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Injection Molding Specialists
. . . 12 to 48 ounce capacity

Pfizer CITRATE PLASTICIZERS...

LIGHT-STABLE
NON-VOLATILE
COMPATIBLE

	Triethyl Citrate	*Acetyl Triethyl Citrate*	*Tributyl Citrate*	*Acetyl Tributyl Citrate*
Molecular Weight	276.28	318.31	360.43	402.46
Assay—not less than	99%	99%	99%	99%
Boiling Point °C. at 1 mm.	126-7	131-2	169-70	172-4
Refractive Index at °C.	1.4405 at 24.5°	1.4386 at 23.0°	1.4431 at 25.0°	1.4408 at 25.0°
Specific Gravity at 25° C.	1.136	1.139	1.042	1.046
Pounds Per Gallon	9.47	9.47	8.70	8.70
% Hydrolysis Boiling 6 hours Standing overnight	0.04	less than 0.01	less than 0.01	less than 0.01
Color	Colorless	Colorless	Colorless	Colorless
Evaporation Rate—gm./cm.²/hr. at 105° C.	0.000107	0.000096	0.000011	0.000009
Solubility in H_2O gm./100 ml.	6.5	0.72	less than 0.002	less than 0.002
Acidity—less than	0.01%	0.01%	0.01%	0.01%
Especially Recommended for	Cellulose Acetate Cellulose Acetate Butyrate	Same as for Triethyl Citrate	All-purpose Plasticizer	Vinyl resins Ethyl Cellulose Cellulose Nitrate

In addition to the above plasticizers available in commercial quantities, Acetyl Trihexyl Citrate is now available in pilot plant quantities for testing purposes. Write today for prices, samples and further information. Chas. Pfizer & Co., Inc., 630 Flushing Avenue, Brooklyn 6, N. Y.; 425 North Michigan Avenue, Chicago 11, Ill.; 605 Third Street, San Francisco 7, Calif.

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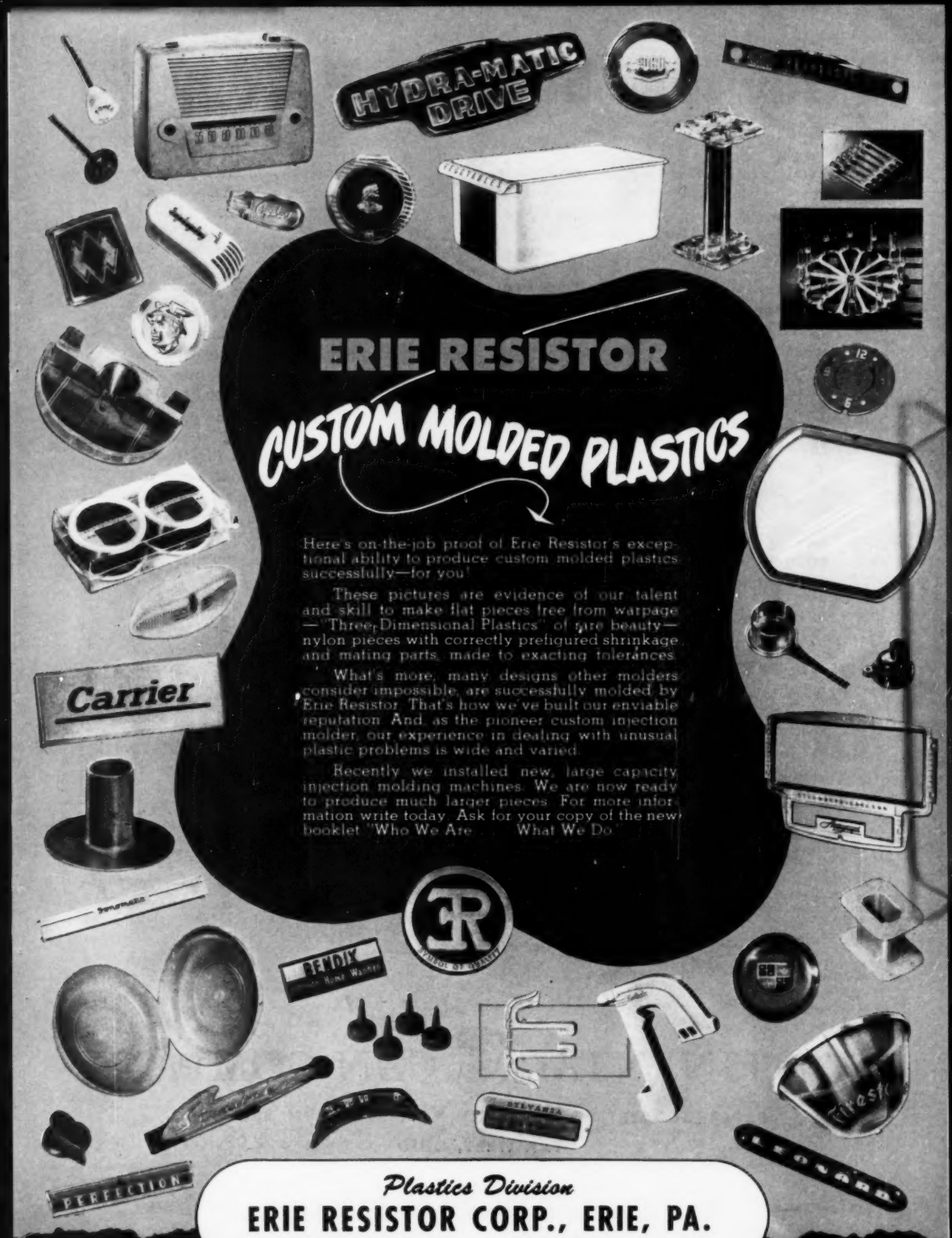
Manufacturing Chemists For Over 100 Years



ERIE RESISTOR

CUSTOM MOLDED PLASTICS

Here's on-the-job proof of Erie Resistor's exceptional ability to produce custom molded plastics successfully—for you!

These pictures are evidence of our talent and skill to make flat pieces free from warpage —"Three-Dimensional Plastics" of rare beauty—nylon pieces with correctly prefigured shrinkage and mating parts, made to exacting tolerances.

What's more, many designs other molders consider impossible, are successfully molded by Erie Resistor. That's how we've built our enviable reputation. And, as the pioneer custom injection molder, our experience in dealing with unusual plastic problems is wide and varied.

Recently we installed new, large capacity injection molding machines. We are now ready to produce much larger pieces. For more information write today. Ask for your copy of the new booklet "Who We Are . . . What We Do."

Plastics Division

ERIE RESISTOR CORP., ERIE, PA.

TORONTO, CANADA • • LONDON, ENGLAND

You can't beat these drums!

Your product may be one of the thousands of items for which a fibre drum is just about the perfect package. And there are some thumping good reasons why a Continental fibre drum is the best drum you can use.

Continental fibre drums can't be beat for rugged durability. They give extra protection to both expensive and dangerous articles for shipment either in this country or abroad. The closures are tight and strong —but easy to open and close.

Continental fibre drums can't be beat for shipping economy. Their light tare weight means savings at today's high freight rates—even greater savings on export shipments to countries where import duties are levied on the gross weight.

Continental fibre drums can't be beat for appearance. They are neat and trim, tailored to your product, and feature quality printing or spray painting. Each Continental drum is a style leader in its field.

Most important, Continental can't be beat for service. There are four strategically located Continental fibre drum plants ready to give you fast, economical and dependable service. Continental packaging engineers are always ready to give you sound advice on packaging problems. Backing up these engineers is a modern laboratory staffed with qualified research and development people.

Continental is big enough and flexible enough to handle any situation. Again and again Continental customers say, "You make us feel as though your fibre drum department is part of our own company." We'd appreciate an opportunity to show you how much real help and service we can deliver.

These drums can help you boom sales

1. The famous Continental LEVERPAK drum with its unique lever-locking device gives maximum protection under hard usage. 12- to 75-gallon sizes.
2. Continental FIBERPAK drum . . . a rigid, all-fibre container in ¾- to 67-gallon sizes.
3. Continental STAPAK drum. Has fibre body with metal top and bottom. Supplied in 2- to 32-gallon sizes.
4. Continental UPAK drum. Custom-made for the shipment of rolled materials.

CONTINENTAL CAN COMPANY

PAPER CONVERTING DIVISION • FIBRE DRUM SECTION

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ENGINEERED BY ELMES

Good Hydraulic Production Equipment Since 1851

At the Yonkers plant of Otis Elevator Company, 200 different molded plastic electric switch parts are produced on this battery of Elmes Hydraulic Presses. Shown at right are three of the 150-Ton Elmes Transfer Molding Presses with 35-Ton Transfer Rams. These presses are push-button controlled, having automatic-timed cycles. The press controls are tied in with high-frequency heating units. Shown below is a line of 50-Ton Elmes Hydrolairs.

Elmes Hydrolairs are the economical answer to many pressing problems. Hydrolairs are fast, full power-operated presses for molding plastics, rubber and virtually all types of pressure applications. They take their power *entirely* from the shop air line. Light, easy to move, no high-pressure piping.

MOLDING PLASTIC SWITCH PARTS ON ELMES HYDRAULIC PRESSES

Sends Production UP ... Costs DOWN ... for Otis Elevator Company

By installing Elmes Hydraulic Presses in their plastic molding department—*and using 15% fewer presses than were previously in operation*—Otis Elevator Company has realized substantial increases in production at considerable savings in cost. The high-speed, accurate operation of these Elmes Presses has made it possible to trim molding time on practically *every one* of the 200 electric switch parts produced!

Elmes Hydraulic Equipment has meant dependable, modern performance in plastics production since the pioneering days of molding. And nearly a century of experience in applying hydraulic machinery has earned the Elmes reputation for recommending the type and style equipment that *solves* production problems and earns *profits*. Let Elmes experience be *your* guide to better plastics molding!

Bulletin No. 5200-A, "Elmes Hydraulic Equipment for the Plastics Industry," will show you the complete line of Elmes Molding Presses that is setting new standards of performance. Copy will be mailed promptly on request.

AMERICAN STEEL FOUNDRIES • ELMES ENGINEERING DIVISION

Distributors in Principal Industrial Centers — *Also Manufactured in Canada*

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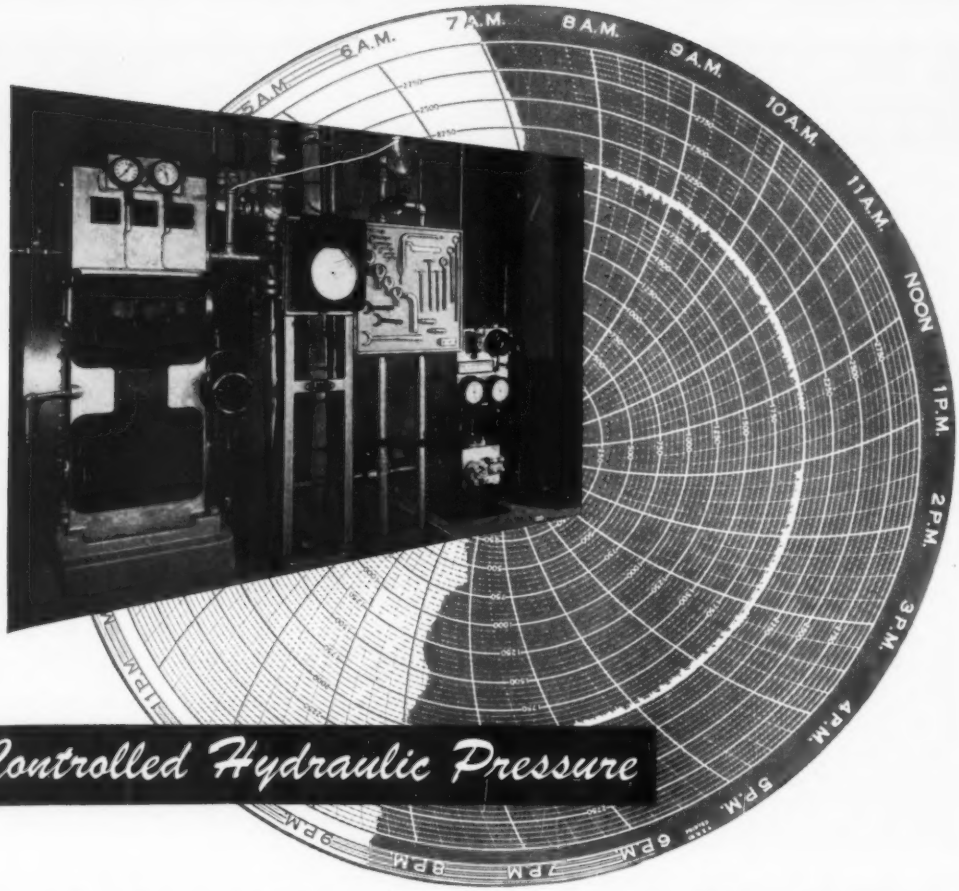
METAL-WORKING PRESSES · PLASTIC-MOLDING PRESSES · EXTRUSION PRESSES · PUMPS · ACCUMULATORS · VALVES · ACCESSORIES



Controlled Hydraulic Pressure

with the ALDRICH-GROFF "POWR-SAVR" Pump

When it comes to maintaining constant hydraulic pressure in the operation of molding presses—you can pat yourself on the back if you've installed an ALDRICH-GROFF "POWR-SAVR" Pump.

Because—the "POWR-SAVR" maintains so constant a pressure that variance does not exceed 2% to 5% of that desired.

Take a look at the pressure chart above. It's an actual record of the hydraulic system at Parker Stearns & Company, manufacturers of rubber and plastics, in Brooklyn, N. Y.—and it shows the practically constant pressure that is maintained by the ALDRICH-GROFF Pump.

Furthermore, this constant pressure isn't the only feature. The installation, which consists of the "POWR-SAVR" and an Aldrich Centrifugal Pump for prefilling the hydraulic presses under low pressure, comprises a *centralized hydraulic system* that serves a large number of rubber molding presses. This simple system assures compactness, a minimum of investment expense, quick accessibility, easy maintenance and greater operating economy. It also affords ease in adjustment of hydraulic pressure to suit varying compounds and press requirements.

Write, today, for more information—or guidance on your hydraulic problems.

ALDRICH

THE ALDRICH PUMP COMPANY

6 GORDON STREET, ALLENTOWN, PA.

Representatives: Birmingham • Bolivar, N. Y. • Boston • Chicago • Cincinnati • Cleveland • Denver • Detroit Duluth • Houston • Jacksonville • Los Angeles • New York • Omaha • Philadelphia • Pittsburgh • Portland, Ore. • Richmond, Va. • St. Louis • San Francisco • Seattle • Spokane, Wash. • Syracuse • Tulsa

BEAUTY TO CAPTURE A CHILD'S FANCY . . .

ENGINEERING FOR STAMINA AND FAST ASSEMBLY . . .

JUST LIKE MOTHER'S

Youngsters everywhere are thrilled by the *attractive useful* Bizzie Bee designed by Charles E. Jones and Associates of Chicago. Although junior in size this fine electric vacuum cleaner has all the modern distinctive appearance of the larger models.

The streamlined plastic housing involved the successful solution of a number of interesting problems in molding techniques and engineering design . . . *design that assures a strong, durable structure facilitating and speeding the assembly* of the motor, fan, dust collector and brush . . . only ten drive screws in all are required.

By rendering a complete plastics service, as in the case of this housing, Imperial Molded can take complete responsibility from engineering and design through mold making, molding and finishing to final delivery . . . in other words from PROBLEM to PRODUCT . . . with control of quality throughout.

If you have a plastic molding problem that involves close tolerances . . . threading . . . side cores . . . or metal inserts, *our engineering service will be of especial value.* We cordially invite your inquiries. Ask for Bulletin No. 300.

OUR STOCK MOLDS for modern colorful knobs, pulls and handles can save you time and money.

CHICAGO, ILLINOIS
IMPERIAL
MOLDED PRODUCTS
CORPORATION
2927 W. Harrison St., Chicago, 12, Ill.
Plastic Molding
BAKELITE • PLASKON • MAKALOT • DUREZ • TENITE • LUCITE • BEETLE

Underside view of the plastic housing and dust collector. Note the sturdy rib structure and functional design.

Visit our Booth B-138 at the National Plastics Exposition

HARTIG EXTRUDERS

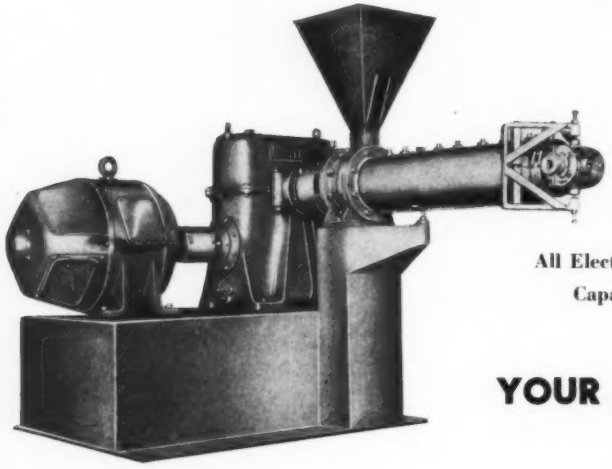
produce better products

SHEETING Extruded polyethylene film is being produced in a flat sheet up to 108 inches wide and down to a ½ mil in thickness. Hartig-designed straight delivery die and take-up combine to produce the finest quality film, either unsupported or as a laminate.

COMPOUNDING Hartig extruders are commonly used for compounding and coloring of all thermoplastic materials. Capacities range to 1,000 pounds per hour, so leading material suppliers as well as molding plants who wish to prepare their own molding powder economically find a Hartig to fill their needs.

WIRE COVERING Nylon, vinyl, and polyethylene are three of the most popular materials being applied to wire and cable by Hartig extruders. Pay-off stands, water cooling troughs, capstans and hydraulic take-ups are all manufactured by, and available from Hartig.

GENERAL EXTRUSIONS Flexibility has made the Hartig a favorite with people who are doing custom extrusion. On either heavy or light work with low temperature or high temperature material, the modern design and exact control afforded on your Hartig means a greater range of finer products.



Hartig No. 2 (3¼" Bore)
With Cross Head

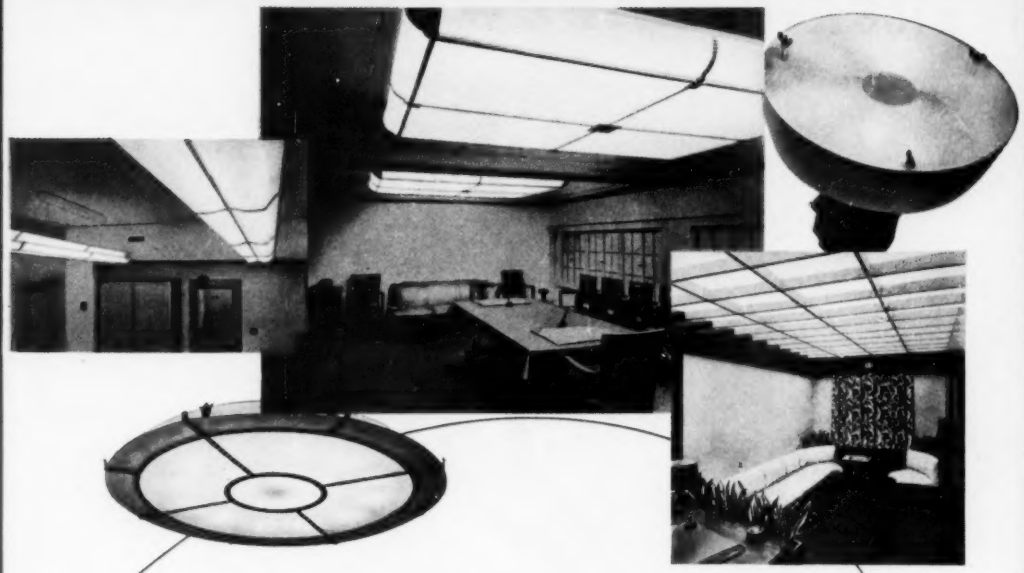
All Electric Extruders From 1¼ in. to 8 in.
Capacities Up to 1000 Lbs. Per Hour

YOUR best value is HARTIG

Brochure available. Write.

The HARTIG ENGINE & MACHINE CO.

448 Hillside Ave.,
Hillside, N. J.



Easy to make—Easy to sell...

PLEXIGLAS

LIGHTING FIXTURES

PLEXIGLAS lighting fixtures have aroused much interest—in public buildings, industrial plants, offices, homes, stores and railway cars.

Municipalities in all sections of the country are approving various types of PLEXIGLAS for electric and gas street lamps. PLEXIGLAS is being used in wall-to-wall luminous ceilings, reflectors above fluorescent tubes, diffusing panels, coffer and cove lighting and totally enclosed units of all kinds.

The trend in lighting is definitely to this acrylic plastic—and there's your opportunity for profitable sales.

Molders and fabricators find PLEXIGLAS easy to form and machine. And its efficiency in diffusing light; resistance to age, weather and breakage; ease of installation; low cost maintenance—all help to assure satisfied customers and a good volume of repeat business. For full details of properties, forming data, sizes, types, patterns and colors, write today on your business letterhead.

Send for this Free Information Today

PLEXIGLAS is a trade-mark, Reg. U. S. Pat. Off. and in principal foreign countries.

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ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

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It's a job for the **EXPERTS**...not the kids!

when it comes to fighting fires...or molding plastics... that's a job for the experts...

TWITCH—*Certainly plastics make better products and better values—sometimes, maybe most times—BUT—*

MORAL—*Not because they are plastics—but because they combine desired characteristics—*
Not because they are cheap—but because they are economical.

ANSWER—*Apply reason, engineering technique and experience to each new application. That's where we come in.*

IDEA—*We've been molders for almost thirty years—in one place, the same people.*

We would like to talk over your chances of using molded plastics—the right plastics, in the right place, at the right price.

Boonton

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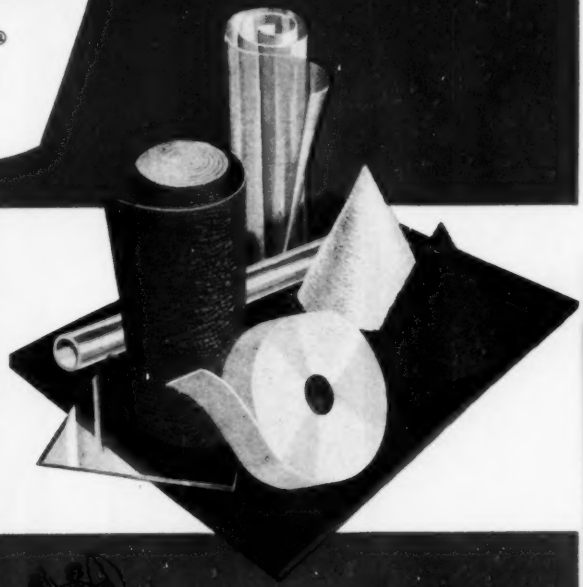
BOONTON 3, N. J. BOONTON 8-2020

molders of most plastics by most methods

marvinol®

Vinyl + Versatile



Extruders of wire insulation, tubing, belting and other continuous shapes benefit from Marvinol's faster extrusion.

Processors find in Marvinol the highest molecular weight resin processable in present equipment.

Superior dimensional stability makes Marvinol ideal in products that must not shrink or deform under heat.

Marvinol's extra toughness and dryness makes plastics products more durable and pleasant to touch.

OTHER PRODUCTS OF NAUGATUCK CHEMICAL:
Latex • Dispersions • Reclaimed Rubber • Plastics
Synthetic Rubber • Rubber Chemicals • Agricultural Chemicals and Aromatics

Marvinol's superior flexibility at low temperatures gives all its products unsurpassed resistance to severe shocks and cold weather.

In products that must resist chemical and abrasive action, Marvinol handles against oils, acids, wear, heat.

Marvinol may be extruded, calendered, injection molded, dip poured for particular product and shop needs.

The entire efforts of our modern development laboratories are for our customers' benefit. All the formulation, compounding and processing information developed here is at your disposal since it is only through you that Marvinol-based products reach the consumer market. So write for the latest technical information today to Dept. M-4, NAUGATUCK CHEMICAL, 601 E. Preston St., Baltimore 2, Maryland.

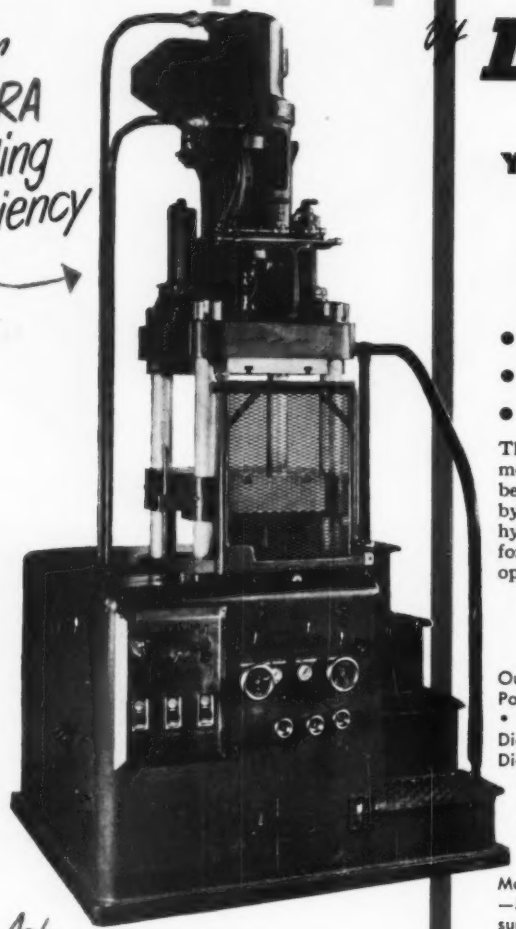
Marvinol

NAUGATUCK CHEMICAL

DIVISION OF UNITED STATES RUBBER COMPANY

multi-purpose press

for EXTRA molding efficiency



of DE MATTIA

You can use this press

3 WAYS!

- **FOR INJECTION**
- **FOR COMPRESSION**
- **FOR TRANSFER MOLDING**

This highly efficient vertical injection molding press is designed so that it can be used for compression and transfer work by making a few low cost additions. All hydraulic, it features smooth fluid power for both injection and mold clamping operations.

DE MATTIA VERTICAL MODEL G1

SPECIFICATIONS

Ounces Molded per Shot — 4 (Styrene) • Pounds of Plasticized Material per Hr. — 50 • Capacity of Feed Hopper (Lbs.) — 50 • Diameter of Injection Plunger — 1⅞" • Diameter of Hydraulic Injection Cylinder — 8½" • Pressure on Material — 20,500 lbs. per sq. in. • Size of Die Plates — 14" x 23" • Mold Opens — Stroke — 15" • Max. Daylight — 19" • Min. Die Space — 4" • Motor — 20 HP @ 1,200 RPM • Pump Capacity — 54 GPM @ 1,000 PSI • Mold Closing Pressure (Tons) — 150 • Floor Space Required — 47" x 59" • Height Over All — 108" • Approximate Wt. of Machine (Tons) — 4¼" • Injection Piston Stroke — 7¼" • Closing Cylinder Bore — 8 1/16" • Complete Injection Time (Max.) — 1.88 Sec. • Heating Cylinder — 4,350 Watts.

Ask **FOR YOUR COPY OF THE NEW CATALOG NOW**

The new De Mattia Catalog contains complete data on both Vertical and Horizontal De Mattia Presses. Also included is full information and specifications on compact, high capacity De Mattia Granulators and Scrap Grinders.

DE MATTIA MACHINE and TOOL CO.

DE MATTIA MACHINE and TOOL CO.

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NEW YORK SALES OFFICE 50 CHURCH ST. — CABLE ADDRESS BROMACH, N. Y.
MIDWEST SALES OFFICE 189 WEST MADISON ST. CHICAGO 2, ILLINOIS

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Monsanto's demonstration of simple color-blending

at the Chicago Plastics Show. This low-cost method of dry coloring Monsanto's new "Colorant-Blend" crystal styrene is suitable for many applications. Twelve standard colors that have exceptional brightness and luster can be produced, with inexpensive equipment. The new process is convenient, guarantees on-the-spot availability of material in desired colors, thereby reducing the need for large inventories of different powders.

SERVING INDUSTRY... WHICH SERVES MANKIND

MONSANTO CHEMICALS – PLASTICS

NOW...

MEET your best prospects

Visit the Monsanto Information Center at the Plastics Show

You can't *afford* to miss Monsanto's Information Center at the Plastics Exposition. For, it has been set up to help *you* meet your customers and prospects . . . the people you want to see, and sell: buyers, end-users, thousands of important people in scores of industries.

Monsanto has already made sure that as many as possible of the influential men you want to talk to will be at the show. In addition to the specific customers and prospects you've told us you want to see, we have contacted thousands of businessmen who are present or prospective users of plastics.

Secondly, Monsanto has set up the Information Center to help you *meet* these people important to you. Here, we have a complete file of their names, with information on where they are staying in Chicago during the show—and facilities to help you meet them.

So, visit the Monsanto Information Center at the Plastics Exposition, Chicago, March 28-31, and tell us whom you want to see. We'll tell you, specifically, who's where. And help you arrange a meeting.

It works two ways—manufacturers looking for a molder or fabricator with *your* experience and facilities can get in touch with you.

If you are not now using Monsanto plastics, it will pay you to investigate their many advantages. Send the coupon today for full information on how some of Monsanto's large family of plastics may help your products.

MONSANTO CHEMICAL COMPANY,
Plastics Division, Dept. MPLP28,
Springfield 2, Mass.

☐ Please send me your booklet, "What Monsanto Plastics Can Do For You."

Name & Title _____

Company _____

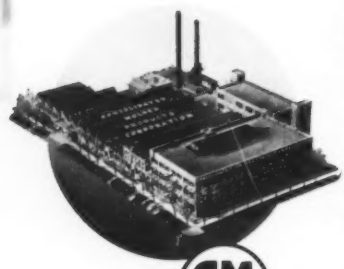
Address _____

City, Zone, State _____

*One of a Series of Messages to the Buyer of Custom Molded Plastics

"S.Q.C."...

this Consolidated *tool* makes your plastics parts live-up to their specifications!



Statistical Quality Control—referred to as one of "the sharpest management tools developed in half a century"— is in full operation here, at Consolidated. With it, we bring to our production quality an ability to make the molded part . . . and its counter*parts* conform to the specifications set down for it by the product manufacturer. The method, by far, represents today's most economical control. It eliminates double inspection—reduces rejects—and raises the standards of an entire output.

The system, one of scientific sampling, is documented by regular timings, gauge readings, jig constructions, graph plottings. In the hands of Consolidated's skilled plastics technicians, "S.Q.C." can't help but insure you the kind of plastics production that makes for a strong custom-molding relationship.

Whenever you are projecting a part —to be molded of plastic—and one that must toe the specifications line —call in a Consolidated sales engineer. Any one of our quickly reached offices is ready to apply experience, know-how and savings to your custom plastics problem.

Please address Dept. G-4

This is Consolidated ... A Million Dollars in Custom Molding Facilities to Guarantee "Your Blueprint in Plastic" ... with Savings!

Consolidated ***Molded Products Corporation***

Plant & Executive Offices: **309 CHERRY ST., SCRANTON 2, PA.**

Branch Offices and Representatives in **New York, Chicago, Milwaukee, Detroit, Cleveland, Bridgeport, Philadelphia—*and other principal cities***

LOW COST, BIG 20-OUNCE Injection Molding Machine

automatic time cycling
molds large pieces fast...
at low operating cost

The Windsor-20 has every improvement you want in an injection molding machine. It's accurate, fast-molding. It delivers sufficient power-packed injection pressure to mold the most intricate shapes, up to a full 20 ounces, even from hard flow plastic materials.

Every element of the Windsor-20 is precision made. Featured is a hydraulically operated retractable injection unit which brings the nozzle against the sprue bushing or away from the mold for sprue clearance or changing of material cylinders.

The high-grade alloy steel cylinder is fitted with three external band heaters, a nozzle heater and an internal heater. All are controlled by means of Energy regulators and three built-in pyrometers.

The Windsor-20 is designed and manufactured in Great Britain by one of the world's largest producers of injection molding machines, molds and dies.

If you contemplate increasing your injection molding capacity and desire the finest equipment available, additional details about the Windsor-20 will be of special interest. Write today for illustrated folder and detailed production data.

SPECIFICATIONS
Windsor-20 Injection Molding Machine with automatic time cycle control

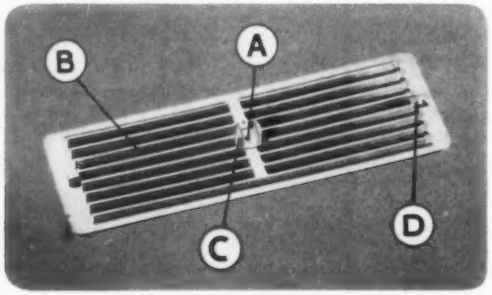
Die locking pressure	380 tons (English) 420 tons American
Maximum area molded	185 sq. in.
Plasticizing capacity	80-100 lbs. per hour (approx.)
Pressure on material	20,000 lbs. psi
Mold opens	17"
Maximum mold thickness	20"
Die plates	34" x 38"
Ounces molded per shot	20 ounces 567 grams (approx.)
Main motor	35 hp
Locking mechanism	multiforced toggle
Weight	18 tons (approx.)
Floorspace	22' x 4'6"

R. H. Windsor Ltd.
16 FINSBURY SQ. LONDON, E. C. 2 ENGLAND
Cables: TECHNIMACH LONDON

T.M.C.
PLASTIC MACHINES

PLASTICS was selected by the York Corporation for the grills on this Yorkaire Room Conditioner. For this service, a grill must resist greater than usual humidity and temperature change . . . must retain its clean, crisp lines and new-looking gloss. Tests proved that the right plastic would meet all of the requirements for this particular application.

Aico engineers carefully consider operating conditions when recommending the material to be used in a product. They will gladly work with you to make your product put on a better front in today's market . . . to help you gain your full share of prestige and profits.



● Polystyrene is used for this grill because of its ample flexual strength . . its thermal and moisture resistance beyond the demands of this air-conditioning unit. Its excellent molding qualities insure a high rate of production from a single cavity injection mold. The material is inert to the metal insert (A) which is molded in for rapid assembly. Clever mold design forms the louvres (B) without removable core pins. Stud (C) and lugs (D) hold the grill in alignment.

Aico has successfully applied plastics to a great variety of products. A Portfolio showing 28 actual applications with constructive comments to help guide you in designing for Plastics is yours for the asking. Write for it today.

AMERICAN INSULATOR CORPORATION
New Freedom, Pennsylvania

AICO PRECISION MOLDING
for over 32 years

MANY THINGS ARE BETTER BECAUSE OF PLASTICS

Save up to 5¢ a pound

with the JAMISON SYSTEM for coloring polystyrene

No Weighing!
No Fussing!
Foolproof!

Here's the first word about the unique JAMISON SYSTEM that enables you to color your own polystyrene as you need it . . . in every color you require . . . at savings up to 5¢ per pound . . . and without the necessity for stocking large quantities of costly pre-colored materials.

More than that, the JAMISON SYSTEM requires no skilled labor. Just one man can tend as many as *four* JAMISON Dry Mixers* and color as much as 2400 pounds of polystyrene per hour!

The two basic features of the JAMISON SYSTEM are

1) the specially compounded JAMISON Color Mixes, which are delivered to you in individual, moisture-proof unit packages, each carefully pre-measured and pre-milled to color exactly 100 pounds of clear polystyrene crystal, and
2) *the JAMISON Dry Mixer, where the mixing takes place — at the rate of 100 pounds of clear polystyrene plus one package of JAMISON Color Mix every 10 to 20 minutes.

All Colors Available

You can get a complete selection of standard transparent and opaque Color Mixes as well as mahogany and black for use in coloring scrap material. In addition, special colors can be compounded to match your samples.

*NOTE: Should you already possess mixing equipment, you won't need the JAMISON Dry Mixer. We'll provide full instructions for using your present machinery.

Just 4 Easy Steps . . .

One Dump *two* 50-pound bags of clear polystyrene in your JAMISON Dry Mixer* (shown above).

Two Add *one* bag of the appropriate JAMISON Color Mix.

Three The automatic timer on the Mixer is pre-set . . . just press the starter button.

Four When Mixer stops, simply empty the completely colored polystyrene . . . It's ready for molding!

Investigate Today. Write for full details

H. JAMISON PLASTICS

11 West 42nd Street, New York, N. Y. • Plant: Freeport, L. I., N. Y.

Royalite

Refrigerator Breaker Strip
Bowling Post for Brunswick-Balke-Collender Co., Inc.
Stone Guard for Truck
Typewriter Case for L. C. Smith Inc.
Bowling Stand for Brunswick-Balke-Collender Co., Inc.
Radio Case
Tote Box
Kitchen Sink for Boat or Trailer
Projector Case for Revere Cameras, Inc.
Television Mask
Radio Set Dial Face

u.s. Royalite

UNITED STATES

2638 NORTH PULASKI ROAD

A REMARKABLE MATERIAL

IN THERMOPLASTIC SHEETS

IT IS	IT CAN BE	IT IS AVAILABLE
Tough	Sawed — Sheared	Stiff or Flexible
Friendly to touch	Sanded — Punched	Hard or Soft
Quiet and Warm	Nailed	Coarse or Fine Grained
Relatively light	Bolted — Riveted	Deep Grained or Shallow
Shatterproof	Sewed	Thick—½ in. to Thin—1/32"
Stainproof	Screwed into	Glossy or Dull
Acid Resistant	Cemented	Decorated or Plain
Excellent Dielectrically	Buffed — Polished	Bright or Somber Colors

AND—it can be formed on standard equipment with conventional techniques

CONSULT THESE EXPERIENCED FABRICATORS OF ROYALITE

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Curbell Inc., 1700 Elmwood Avenue, Buffalo 7
Dual Fabricators Corp., 808 Driggs Ave., Brooklyn 11
Dura Plastics Inc., 1 W. 34th St., New York 1
Steiner Plastics Mfg. Co., 47-30 33rd St., Long Island City 1

NEW JERSEY
Thermacote Co., 320 Jefferson St., Newark 5
Van Beek Industries, 23 Park St., Orange
Wood's Plastic Inc., 410 Frelinghuysen Ave., Newark 5

MARYLAND
Fawn Plastics Co., 2902 Hamilton Ave., Baltimore 14

GEORGIA
Gladwin Plastics, 542 Courtland St. N.E., Atlanta

PENNSYLVANIA
Lee Plastics, A and Lippincott St., Philadelphia 34
Halsen Mfg. Co., 5919 Webster St., Philadelphia

OHIO
Fabri-Form Co., Box 36, Cambridge

INDIANA
General Plastics Corp., 1400 N. Washington, Marion
Plastic Mfg. & Designer Corp., 422 W. 9th St., Indianapolis 6

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Croname Inc., 3701 Ravenswood Ave., Chicago 13
G. Felsenthal & Sons, 4100-4118 W. Grand Ave., Chicago 51
Lamacoid Fabricators Inc., 4545 W. Cortland St., Chicago 39
Neo Products Co., 2534 So. Kedzie, Chicago 23
Northwestern Plastics Inc., 2535 W. Washington Blvd., Chicago 12
Precision Plastic Products Inc., 628 W. Lake St., Chicago 6

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Detroit Macoid Corp., 12340 Cloverdale Ave., Detroit 4
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Woodall Industries Inc., 7565 E. McNichols Rd., Detroit 34

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Regal Plastics Co., 710 Main St., Kansas City

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Glow-Lite Plastic Arts Co., 715 So. Comal St., San Antonio 5
Plastic Engineering Co., 2101 69th St., Houston 11
Plastic Products of Texas, 3319 Love Field Dr., Dallas

MINNESOTA
Plastics, Inc., Chestnut & Ryan Sts., St. Paul 2

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C. K. Castaing Studio, 17682 S. Huntington Beach Blvd., Huntington Beach
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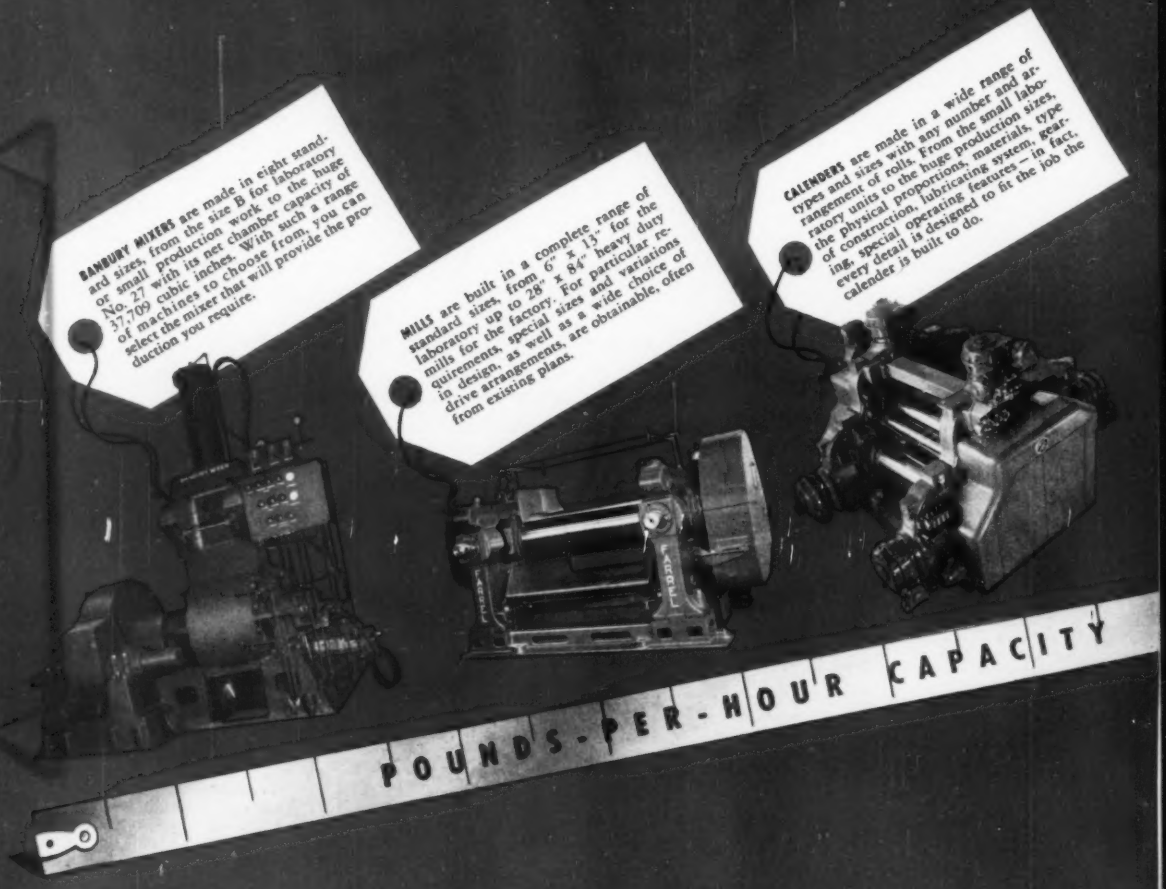
Peninsula Plastics Co., 2901 El Camino Real, Redwood City

The United States Rubber Company at 2638 North Pulaski Road, Chicago, Illinois, has complete Engineering, Designing, and Styling Departments to assist fabricators on the technique to employ, and in the art of fabricating, most efficiently with ROYALITE.

RUBBER COMPANY
CHICAGO 39, ILLINOIS

FARREL-BIRMINGHAM PROCESSING UNITS

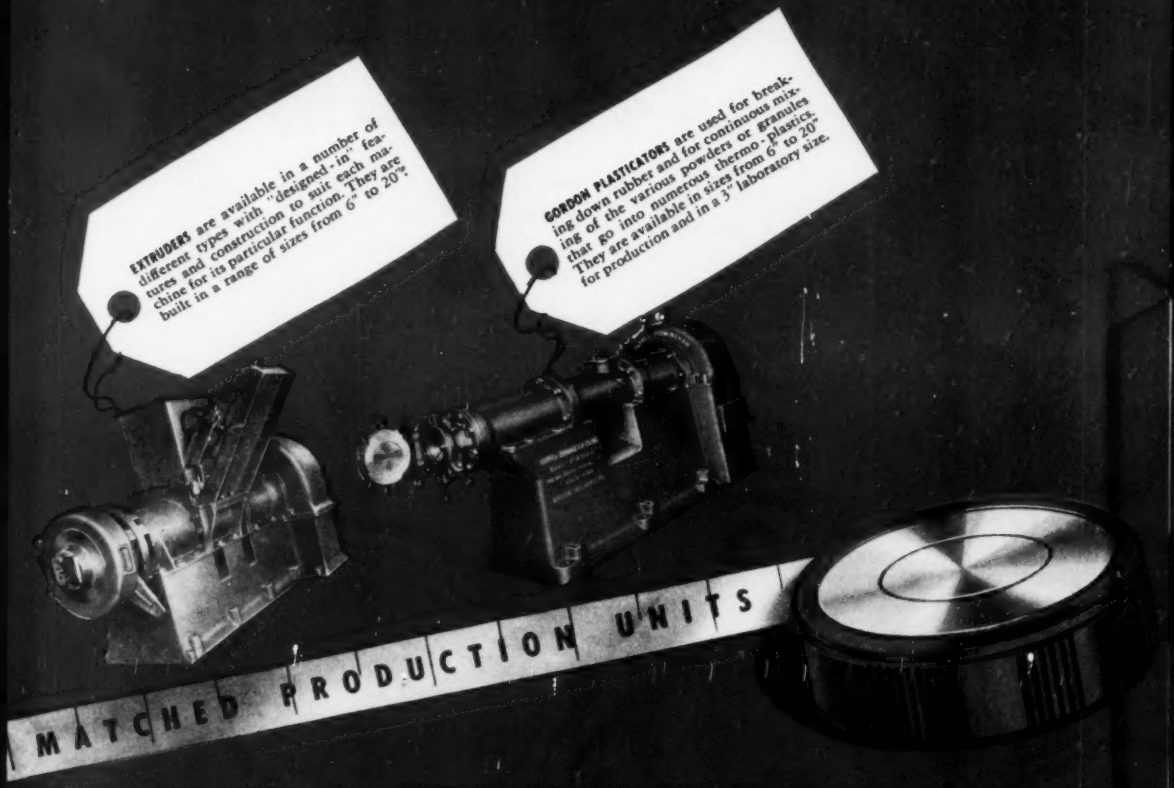
are "measured" for production efficiency


BANBURY MIXERS are made in eight standard sizes, from the size B for laboratory or small production work to the huge No. 27 with its net chamber capacity of 37-709 cubic inches. With such a range of machines to choose from, you can select the mixer that will provide the production you require.
MILLS are built in a complete range of standard sizes, from 6" x 13" for the laboratory up to 28" x 84" heavy duty mills for the factory. For particular requirements, special sizes and variations in design, as well as a wide choice of drive arrangements, are obtainable, often from existing plans.
CALENDERS are made in a wide range of types and sizes with any number and arrangement of rolls. From the small laboratory units to the huge production sizes, the physical proportions, materials, type of construction, lubricating system, gearing, special operating features — in fact, every detail is designed to fit the job the calender is built to do.
POUNDS-PER-HOUR CAPACITY

F-B* PRODUCTION UNITS

Banbury Mixers • Plasticators • Pelletizers • Mixing, Grinding, Warming and Sheeting Mills • Bale Cutters • Tubing Machines • Refiners Crackers • Washers • Calenders • Hose Machines • Hydraulic Presses and Other Equipment for Processing Rubber and Plastic Materials

*TRADE-MARKS REGISTERED


EXTRUDERS are available in a number of different types with "designed-in" features and construction to suit each machine for its particular function. They are built in a range of sizes from 6" to 20".
GORDON PLASTICATORS are used for breaking down rubber and for continuous mixing of the various powders or granules that go into numerous thermo-plastics. They are available in sizes from 6" to 20" for production and in a 3" laboratory size.
MATCHED PRODUCTION UNITS

Economical processing is dependent, to a large extent, on a continuous flow of production. In calendering, for example, once proper running temperature has been reached and the gauge accurately set, interruption of scheduled production can be costly.

Farrel-Birmingham processing units—such as Banbury mixers, mills, calenders and extruders—are built in a wide range of sizes. This enables us to engineer a complete production layout in which all machines work full time, at capacity.

In such a layout, production flows evenly, without costly interruptions caused by the "starving" or "choking" of succeeding machines. Furthermore, manual aid and supervision are reduced to a minimum. In some cases an individual unit will require no operator at all.

Before you purchase new processing equipment, why not look into the advantages of matched units, *"measured" for production efficiency*? One of our engineers will be glad to discuss your processing problems with you at any time. Why not call on them today?

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONNECTICUT

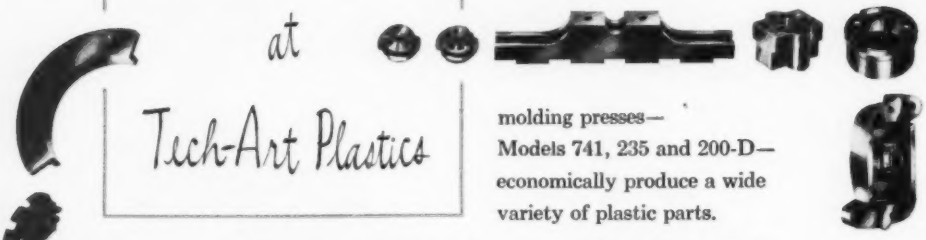
Plants: Ansonia and Derby, Conn., Buffalo, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

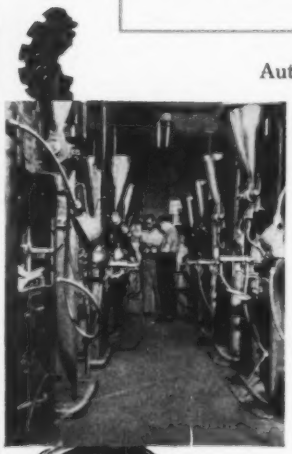
Farrel-Birmingham*

Low Cost... Reliable AUTOMATIC MOLDING at Tech-Art Plastics

At Tech-Art
Plastics Company,
Long Island City, N. Y.
. . . pioneer molders since 1891
. . . Stokes completely automatic



molding presses—
Models 741, 235 and 200-D—
economically produce a wide
variety of plastic parts.



Automatic molding has these three basic advantages: *low labor cost* . . . one operator can tend a battery of presses; *highest quality parts* . . . produced under identical conditions of time, temperature, and pressure . . . reducing rejects; and, *controlled low inventory* . . . parts are produced as needed.

Stokes fully automatic molding presses greatly simplify molding practice . . . molding costs are accurately determined before production starts. Fully automatic molding is reliable, foolproof, flexible.

If you want to know what automatic molding can save you in production costs, send your samples or blueprints for a free analysis.

STOKES MAKES Automatic and Semi-Automatic Molding Presses, Plunger Presses, Closure Presses, Preforming Presses, Industrial Tableting and Powder Metal Presses, Vacuum and Special Processing Equipment, Water Stills and Special Machinery.

F. J. STOKES MACHINE COMPANY

5934 TABOR ROAD

PHILADELPHIA 20, PA.

F. J. Stokes Machine Co.
5934 Tabor Road
Philadelphia 20, Pa.

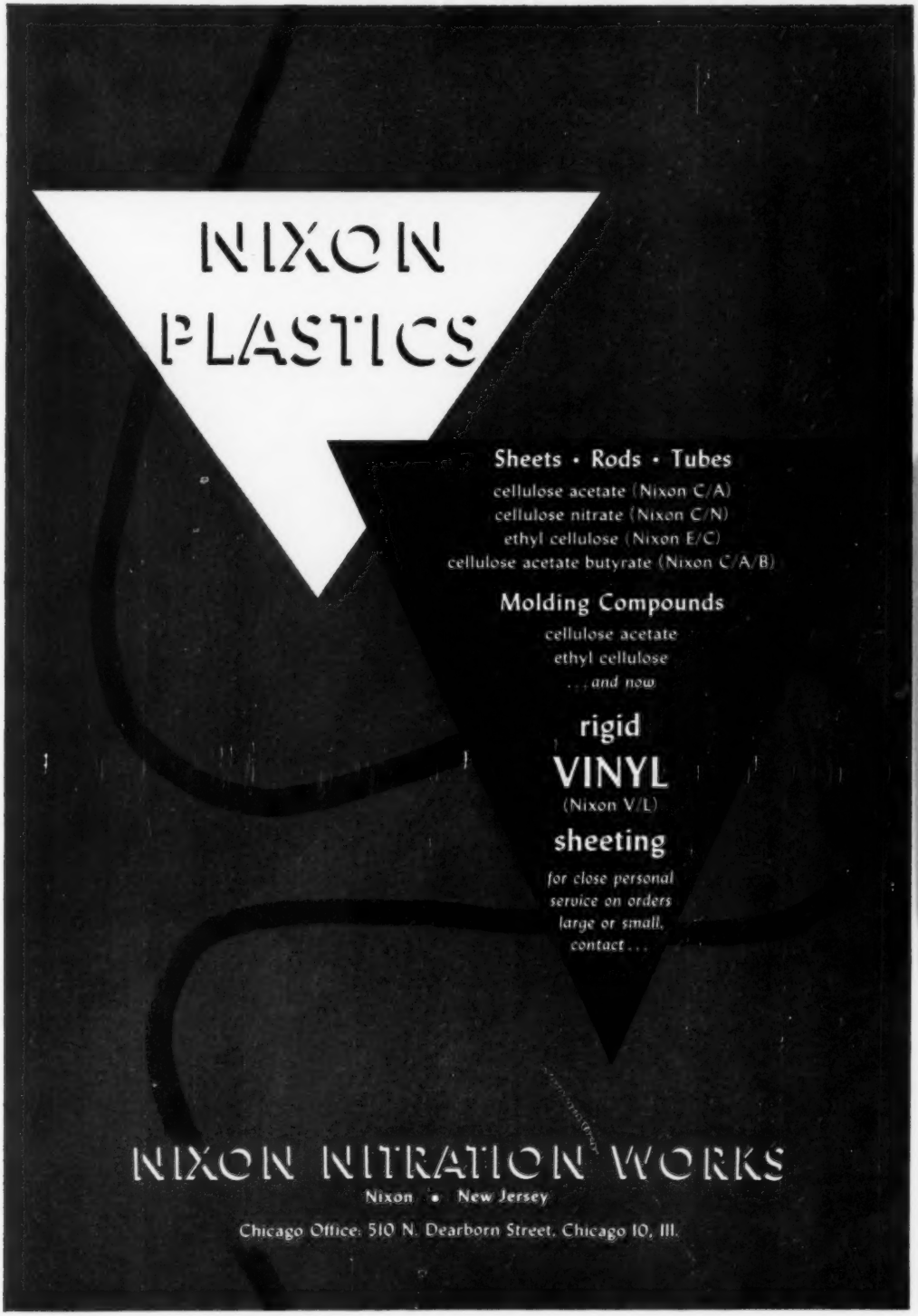
☐ *Send me complete literature on Stokes automatic molding presses.*
☐ *Part or blueprint is attached for your free analysis service.*

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____ DR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ethyl cellulose (Nixon E/C)
cellulose acetate butyrate (Nixon C/A/B)
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PLASTICS MACHINERY BULLETIN

Reporting News and Machine Design Developments

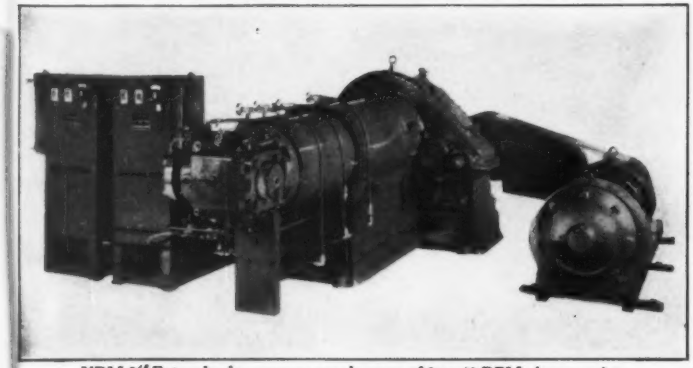
IN BUSINESS TO **NRM** REDUCE YOUR COSTS

8″ EXTRUDER TYPICAL OF NRM's WIDE RANGE

Available both electrically or oil heated

NRM can furnish you exactly what you want in plastics extrusion equipment . . . everything from the 1″ Bench Model extruder which serves so well as a laboratory pilot plant to the 8″ extruder shown below and larger sizes for special applications.

The 8″ extruder is a 600-800 lb. capacity "workhorse". NRM furnishes this machine with dual water-cooled 5″ diameter capstans, complete with trough and sprays. Drive is variable speed; 100 h.p. dynamatic water-cooled coupling. Heat-treated cut steel herringbone gear transmission with oversize thrust bearing.



NRM 8″ Extruder has screw speed range of 0 to 40 RPM. Accessories: crosshead for wire and cable covering up to 4″ covered diameter.

Only manufacturers using NRM plastics extrusion equipment can point to *typical hourly production figures such as these:* 34 lbs. of Saran filament; 250 lbs. of film; 650 lbs. of cable covering; 1,500 lbs. of pellets.

The reasons are that only the NRM Torpedo-type screw assures maximum uniform extrusion with high temperature compounds like cellulose acetate, ethyl cellulose, polystyrene, etc. And only NRM gives you balanced heat control; a standard temperature range up to 750°F. with absolute control over frictional heat with NO COMPRESSED AIR, NO PIPES, NO WATER COOLING!

NRM *pioneered* extruders built solely for thermo-plastics extrusion—now have more than 1,000 installations in operation. It may pay you well to obtain complete information on NRM Plastics Extrusion Equipment. Write or wire for full details: National Rubber Machinery Company, Akron 8, Ohio.

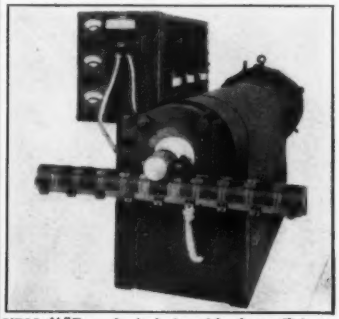
Only NRM Equipment Handles "All" Extruding

Only NRM plastics extrusion equipment can handle "all" extrusion jobs. For example, NRM builds special extruders for NYLON and SARAN. More Saran extruders have been built by NRM than by other manufacturers combined.

When you buy NRM you're buying over 12 years' creative engineering and actual manufacturing experience. Result: features exclusive with NRM—which give you more uniform extrusions with lower maintenance and production costs.

All Sizes Film Dies Available Adaptable for All NRM Extruders

NRM is serving the plastics industry all over the world with a full line of extrusion equipment designed to meet the most exacting requirements in thin-wall film and thin-gauge expanded tubing production.

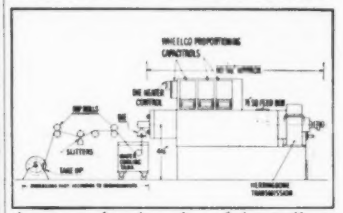


NRM 4½″ Extruder is designed for fast, efficient production of high temperature materials. Capacity: up to 300 lbs. per hour.

Shown above is the NRM 4½″ All-Electric Extruder equipped with T-type polyethylene die for the extrusion of 40″ wide film. All sizes of dies are now available for polyethylene film .0015″ to .010″ thick (40″ to 72″ sheet width); all dies are readily adaptable for NRM extruders. In addition, NRM engineers will work with you to furnish sheeting dies to individual specifications.

FILM TAKE-UPS IN TWO SIZES

NRM now makes sheeting take-ups available in two sizes—48″ and 72″. Below is



shown an elevation plan of the 4½″ extruder and take-up. This is typical installation and shows the water cooling tank, nip rolls and take-up.

NATIONAL RUBBER MACHINERY CO. General Offices & Engineering Laboratories Akron 8, Ohio

PLANTS at Akron and Columbiana, Ohio and Clifton, N. J.
AGENTS East: National Rubber Machinery Co., Clifton, N. J.
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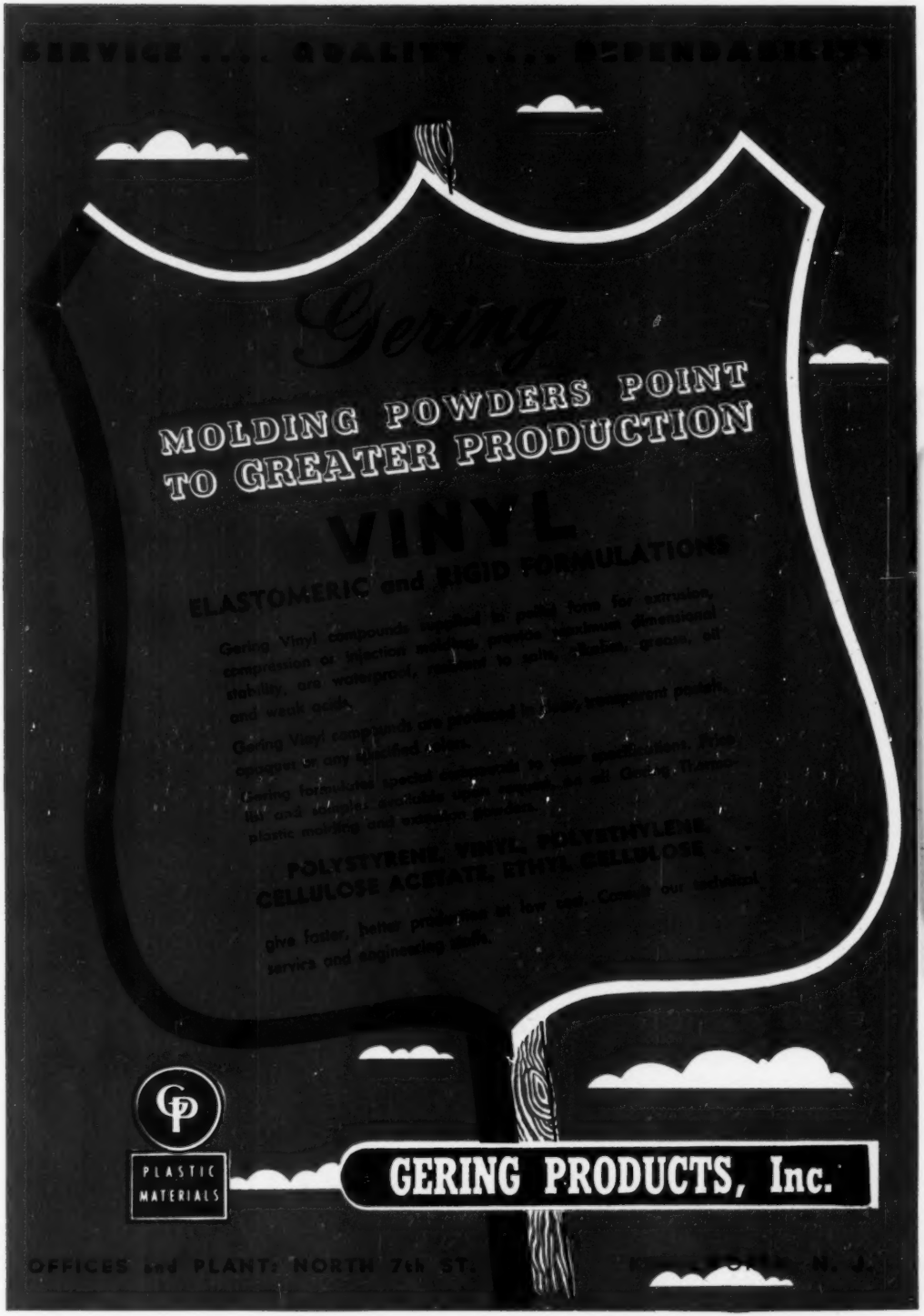
EXPORT Plastics Machinery: OMNI EXPORT CORPORATION
460 4th Ave., New York 16, N. Y.

Creative Engineering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Thoroughly Blend Substances into an Inseparable Mass

The 4-Way Mixing Action of the Sturtevant Dustless Blenders thoroughly mixes two or more substances into an inseparable whole . . . every part of which is the same analysis. Single receiving and discharging opening insures tight sealing during mixing process. "Open-door" accessibility permits thorough cleaning. The fast, accurate mixing operation increases output . . . cuts mixing costs. Available in many sizes with mixing capacities from ¼ ton to 75 tons per hour. Write for information and catalog.

Receiving — The ingredients to be mixed enter the mixing chamber of drums through a chute. Note scoops which carry up and dump the ingredients as drum rotates assuring a more uniform mix.

Discharging — Throwing a lever closes the inlet and mixer is in discharging position. The completely mixed materials drop off the lifting scoops and discharge through chute without segregation of ingredients.

The Sturtevant Mill Company

110-A Clayton Street, Boston 22, Massachusetts

Designers and Manufacturers of: CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

Scaled to Increased Sales

with "Hercules" Cellulose Acetate . . .

Models produced by Products Miniature Co., Inc., Milwaukee, Wis., with "Hercules" Cellulose Acetate Molding Powder.

Here are perfectly scaled miniatures, so realistic that their pictures might be mistaken for photos of their full-size counterparts in International Harvester Company's current line of trucks. International dealers are finding them valuable visual aids in building good will and increased sales. Molded with "Hercules" Cellulose Acetate, they reflect the quality and durability of the originals.

Miniatures of all kinds—whether they be designed as sales aids or toys—look better, work better, and have a longer service life when made with tough, colorful cellulose acetate. Ideally adapted to low-cost rapid-cycle injection molding, acetate provides the sharp, accurate detailing that makes for lifelike realism. The form retention and strength of high-acetyl acetate in lightweight, thin-wall sections spell added savings in material costs.

Why not scale *your* product to increased sales with versatile cellulose acetate. Our technical staff invites your inquiries.

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MOLDABILITY
FORM RETENTION
COLORABILITY

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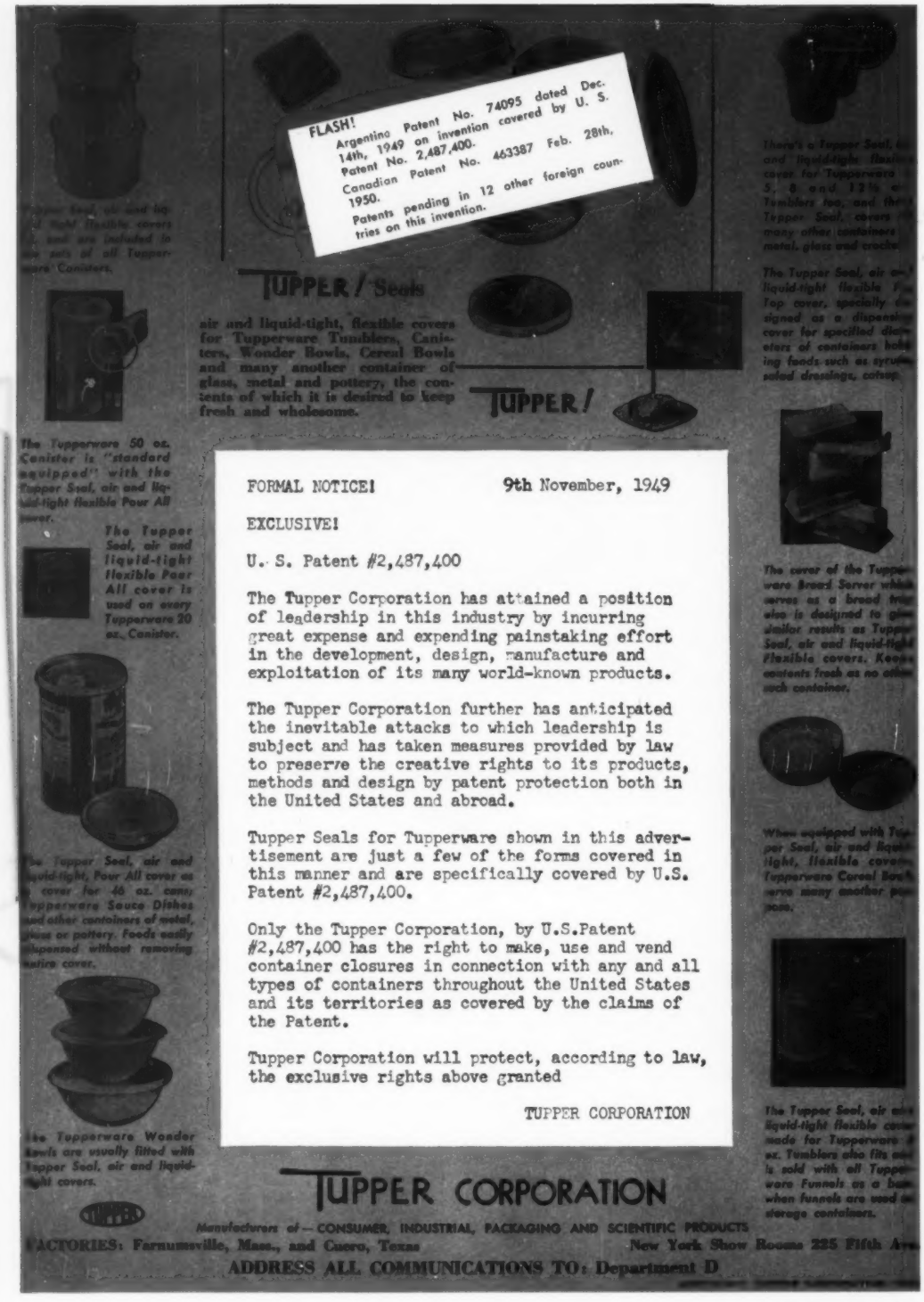
FLASH!
Argentina Patent No. 74095 dated Dec. 14th, 1949 on invention covered by U. S. Patent No. 2,487,400.
Canadian Patent No. 463387 Feb. 28th, 1950.
Patents pending in 12 other foreign countries on this invention.
TUPPER / Seals
air and liquid-tight, flexible covers for Tupperware Tumblers, Canisters, Wonder Bowls, Cereal Bowls and many another container of glass, metal and pottery, the contents of which it is desired to keep fresh and wholesome.
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FORMAL NOTICE! 9th November, 1949
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The Tupper Corporation has attained a position of leadership in this industry by incurring great expense and expending painstaking effort in the development, design, manufacture and exploitation of its many world-known products.
The Tupper Corporation further has anticipated the inevitable attacks to which leadership is subject and has taken measures provided by law to preserve the creative rights to its products, methods and design by patent protection both in the United States and abroad.
Tupper Seals for Tupperware shown in this advertisement are just a few of the forms covered in this manner and are specifically covered by U.S. Patent #2,487,400.
Only the Tupper Corporation, by U.S.Patent #2,487,400 has the right to make, use and vend container closures in connection with any and all types of containers throughout the United States and its territories as covered by the claims of the Patent.
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POWER SYSTEMS*

unit hydraulic press drives

• Press efficiency doubled • Sustained pressures up to 7500 psi

• Accumulators eliminated • No need for oil cooling

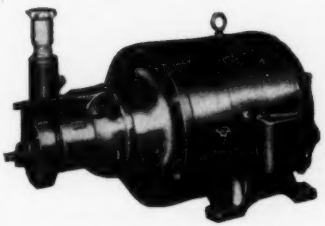
The Electraulic Power System is a complete, coordinated assembly of hydraulic pressure generating and control equipment. It makes any hydraulic press a self-contained, independent unit that operates with almost incredible efficiency. Designed to use an extra *light* viscosity oil, each Electraulic system provides amazingly fast and responsive action, with hydraulic shock entirely avoided at *all* pressures.

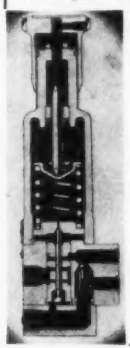
THESE ELEMENTS MAKE THE SYSTEM WORK

THE POWER UNIT

The Electraulic Power Unit is a complete self-contained assembly, with electric motor, integrally mounted high pressure axial plunger pump and all pressure controls. A large volume rotary pump may be included for low pressure traverse service. The high pressure pump may be a duplex type with small final volume for sustained pressure duty. Continuous pressure ratings are from 3750 to 7500 psi with peak capacity up to 9000 psi.

Volumetric efficiency of the axial plunger pump is at least 97% — and the oil does not overheat, eliminating need for an oil cooler. This high Electraulic efficiency means low cost service with less wear, long life, low maintenance. Electraulic's high pressure ability means full power transmission with smaller volumes of oil, smaller piping, smaller valves, and greater reserve on the lower pressure jobs.





PRESSURE CONTROLS

1 *Electraulic Sustained Pressure Valves.*

Function silently with instantaneous response to pressure rise; hydraulic cushion action absorbs all pressure fluctuations. Calibrated adjustment.

2 *Electraulic Pump Unloaders*

Combination Type, including sustained pressure valve, for two-volume high pressure pumps.

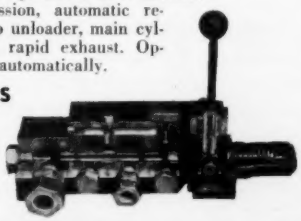
"Amplifier" Type for remote control to unload entire high pressure pump capacity. Quick response without shock. Models are also available for unloading large volume, low pressure pumps in two-pressure circuit.

DIRECTIONAL CONTROLS

For regulating all ram movements. Electraulic Directional Control Valves are available in combination models, with additional features important to high pressure operation. This includes: Automatic decompression, automatic remote control of pump unloader, main cylinder pre-filling and rapid exhaust. Operated manually or automatically.

FLOW CONTROLS

To regulate rates of ram traverse or pressing movements, sequence actions, and other similar functions.



GET ALL THE DETAILS NOW!

Write today for literature containing detailed engineering data on ELECTRAULIC Direct Hydraulic Systems and their associated pumps, valves and controls. Remember, each ELECTRAULIC installation is complete, includes every element needed for press operation, and is specially engineered for the specific press it powers.

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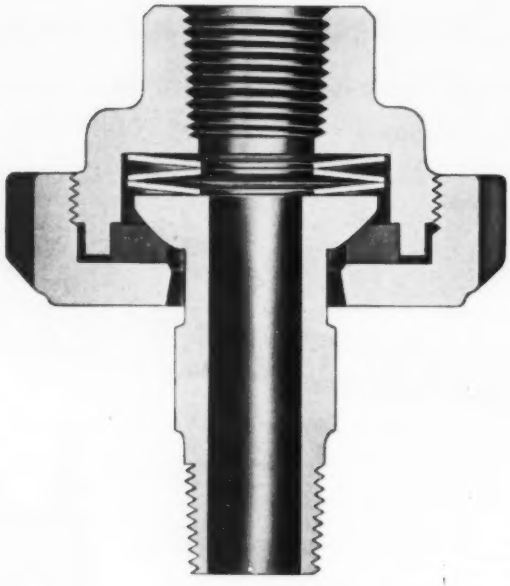
Improved Barco Rotary Swivel Joints
FOR MINIMUM FRICTION



FRICTION-FREE PERFORMANCE WITH LOWER TURNING TORQUE. This compact, lightweight, low cost joint is especially efficient at high and low temperatures and pressures. It handles alternating steam and cold water without leakage. It is much more compact for the same capacity and has performed successfully on continuous rotation applications up to 30 RPM. This new, low torque joint will greatly reduce power costs and worker fatigue. It is practically maintenance free.

WIDE TEMPERATURE AND PRESSURE RANGES. The new Barco Rotary Swivel Joints withstand these extreme ranges with complete safety, no chance of bursting. Angular motion compensates for misalignment and there is no restricted internal diameter as in flexible hose.

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Install these remarkable joints now. Our engineers will gladly discuss your problems. Sizes ⅜", ½", ¾", 1". When ordering, give complete information about pressures, temperatures, fluids or gases, and any other special conditions.

BARCO ***FLEXIBLE JOINTS***

Not just a swivel joint ...but a combination of a swivel and ball joint with rotary motion and responsive movement through every angle.

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From nose to tail assembly...from wing tip to the stream-lined radome suspended underneath the fuselage, Lockheed's latest answer to the threat of submarine warfare is the best evidence of the aircraft industry's confidence in ZENITH L.P.* parts.

No organization surpasses ZENITH in equipment, experience and production economy in the field of L.P.* FIBERGLASS lamination. That's why ZENITH facilities have been called upon to cooperate with the engineering and production staffs of not only the aircraft, but a wide range of other industries in all parts of the United States.

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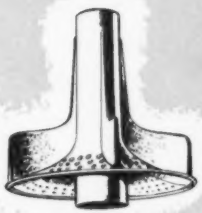
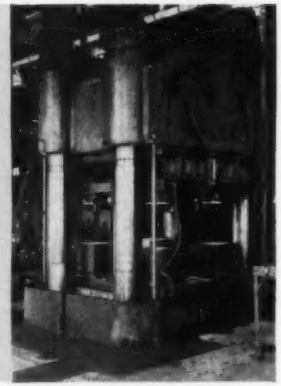
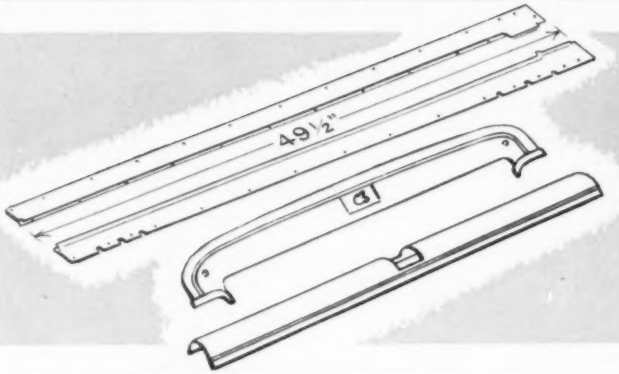
MAYTAG GYRATATOR

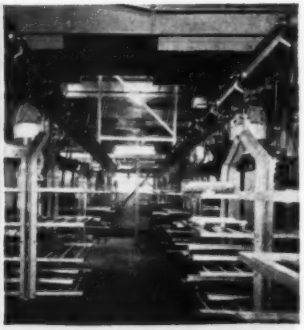


BENDIX AGITATOR





cut your molding costs with new applications... mass methods... at



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General

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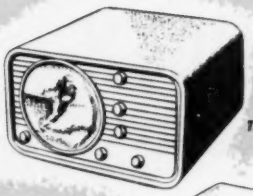
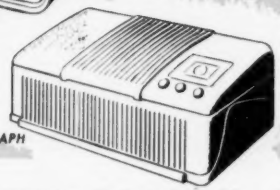
PLASTICS DIVISION

MULTI-CAVITY COMPRESSION MOLDING

At last—"large part" users can have a combination of big equipment and ingenuity to reduce expenses and enable new applications in plastics. General American equipment includes compression presses up to 2,000 tons—and die-makers and set-up men who know how to use this equipment to its best advantage. That's the reason why so many television, radio and top-ranking appliance manufacturers now come to General American.



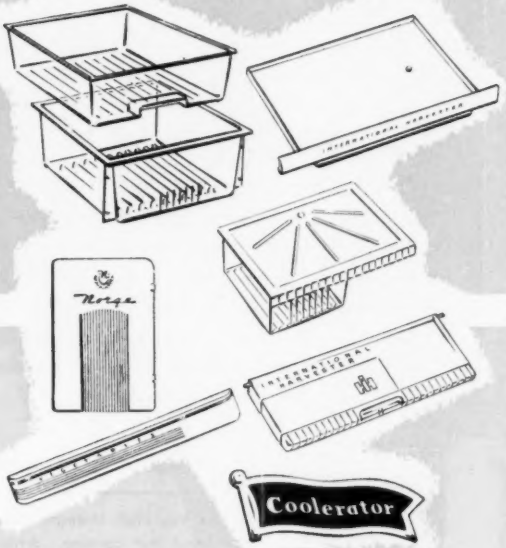
TELE-TONE TELEVISION SET



PHILCO RADIO-PHONOGRAPH

BIG INJECTION PIECES POSSIBLE

The economy of molding high-impact polystyrene in large pieces has proved itself at General American. The Frigidaire breaker strip shown here is 49½ inches long. The other parts illustrated have given important savings to such famous manufacturers as Servel, International Harvester, Norge, Crosley, Westinghouse, Frigidaire, Kelvinator, Admiral and Coolerator. Close tolerances in these pieces is essential—and a specialty at General American. Injection presses from 2 to 48 oz. are available.



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To back up your production line, General American offers you high speed, completely mechanized Logoquant treating and painting of polystyrene. General American has reached an exceptionally high mechanical efficiency in painting and assembly.

American

General American Transportation Corporation

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STRENGTH *without* BULK

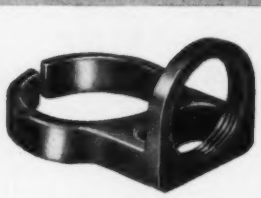
THAT'S WHY BRYANT ELECTRIC SPECIFIES ROGERS RX 400

Bryant Electric sought and found in Rogers RX 400 phenolics the superior impact and flexural strengths required for critical parts. These nodular molding compounds have a maximum bulk factor of 3.5:1, preform into tablets that are hard to chip, and mold in the same molds as general purpose materials.

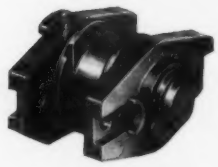
Note the thin wall sections on the coil spool and switch opening pin. Parts don't have to be beefy to be strong when you use Rogers plastics. Intricate detail is no problem either — Rogers thermosetting materials have excellent flow characteristics. For fast molding of high strength plastic parts, investigate Rogers phenolic materials. Our technical representatives are ready to work with you.

NEW CATALOG AVAILABLE

If you use high strength plastics, you need our catalog. Write on your firm's stationery to Dept. P.



TUBE SUPPORT



PUMP RELAY COIL SPOOL

SWITCH OPERATING BAR

COIL SPOOL

SWITCH OPENING PIN

Skillful molding tells a gripping story

Among mimeograph artists, the hand is now quicker—and so is the eye, thanks to these plastic stylus handles. Their carefully developed and exactly executed non-roll design gives them a firmer grip and better balance which results in greater ease and speed for artists. The weight is ideal and durability assured through the skillful molding of the *correct* plastic material. Vivid, distinctive colors make the styli types quickly identifiable, thereby saving the artist's time.

The production of these stylus handles naturally presented their own unique engineering and molding problems. But the end results: better performance, smarter appearance, more sales appeal are typical of all Mills plastic products, created in America's finest, most modern molding plant.

One of our representatives will gladly show you how to make sure your plastic products have these important extra values. Tell us today when he may call.

Mimeograph stylus handles molded for A. B. Dick Company, Chicago

Write on your letterhead for the new Injection Molded and Extruded Plastics Catalog. Or, for detailed information about ~~CHICAGO~~ PLASTICS* *piping, tubing and fittings, write for circulars containing data and illustrations.*

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ELMER E. MILLS CORPORATION

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All dressed up

IN MPc MOLDED PLASTICS

and going places

This Admiral 3 speed phono-radio is the life of the party at many a happy gathering. And it owes much of its popularity to the sleek **MPc**-molded plastic cabinet.

Buyers have learned to look for the eye-pleasing color, the smooth styling and the rugged, mar-proof durability of plastics. They have learned to expect the all-can-afford-it low price attainable *only* with a plastic housing. Ingenious design of the one-piece base casting provides a housing for the radio and supports the record player mechanism. Molded-in openings for speaker, dial and controls permit speedy assembling without additional, costly fabrication.

Here at **MPc,** inventive engineering skill…plus ample tool-room and production facilities…can make plastics perform to *your* commercial advantage. Submit your plastics product or problem to MOLDED PRODUCTS CORPORATION, 4535 W. Harrison Street, Chicago 24, Illinois.

PLASTICS DIVISION

MOLDED MPc PRODUCTS

CORPORATION

announcing

A NEW ODOR-FREE COLORLESS PLASTICIZER

Good-rite GP 233

Now joins the Good-rite plasticizer family

GP 233: Developed by B. F. Goodrich Chemical Company research, this new product makes available, for the first time, a dioctyl adipate plasticizer that is odor-free and color-free. It imparts excellent low-temperature properties to vinyls, and the objectionable odor characteristic of ordinary "low temperature" plasticizers is eliminated. Ideal for use with Geon resins in making better-quality film and sheeting, insulation for wire and cable, and many more consumer and industrial products.

Other B. F. Goodrich Chemical Company plasticizers . . .

GP 261: A better-balanced, dioctyl phthalate plasticizer—odorless and color-free—for use with vinyl and other synthetic resins as well as nitrile type rubber. It offers excellent light stability, lower volatility, better electrical properties, lower water extraction.

Hycar *American rubber:* Used as a plasticizer, Hycar American rubber gives high impact strength and easier flow in the mold to phenolics. It is a non-migrating, completely non-volatile plasticizer for vinyl resins.

WRITE for technical bulletins on any of these plasticizers. Please address Dept. CG-1, B. F. Goodrich Chemical Company, Rose Bldg., Cleveland 15, Ohio. Cable address: Goodchemco.

At the 4th National Plastics Exposition, Navy Pier, Chicago, Illinois, March 28-31 —see the B. F. Goodrich Chemical Company display, which includes this new plasticizer. Booth 130.

B. F. Goodrich Chemical Company A DIVISION OF THE B. F. GOODRICH COMPANY

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A Division of
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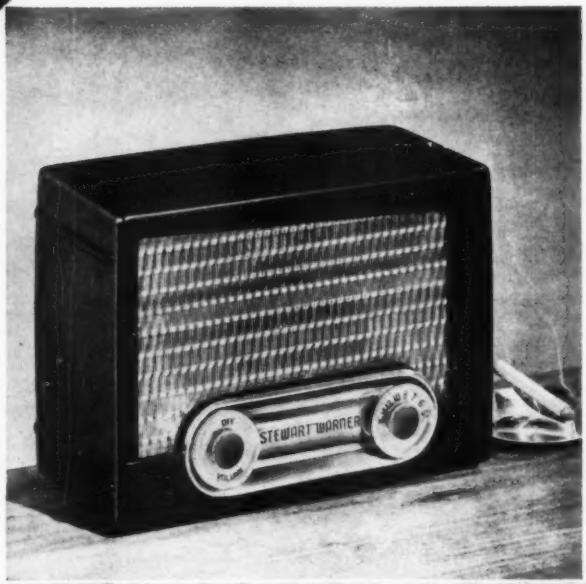
The Industrial Plastics Co. is geared to save you time and money through better engineering and modern methods. We approach each design with a thorough knowledge of the problem. You get extra attention and extra service! From the first time we see your product to the last detail in the design of its plastic parts, every step is carefully mapped out and controlled in our efficient factory. Call us in . . . compare our methods with your present methods. Compare cost, too.

Industrial accomplished what many said was impossible. Stewart-Warner wanted a portable radio cabinet, back and handle molded in as few dies as possible. Industrial proposed a one cavity die for the cabinet and a two cavity family die for the ⅝" thick handle and the back having a ⅛" typical wall thickness. The problem of molding two such dissimilar parts with greatly varying thicknesses in the same die was met with careful controlled-flow gating.



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STUDEBAKER CORP. **RADIANT MANUFACTURING CORP.**
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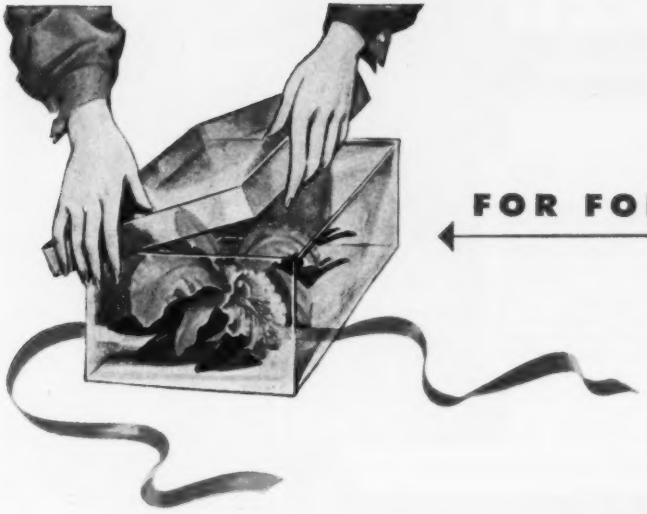
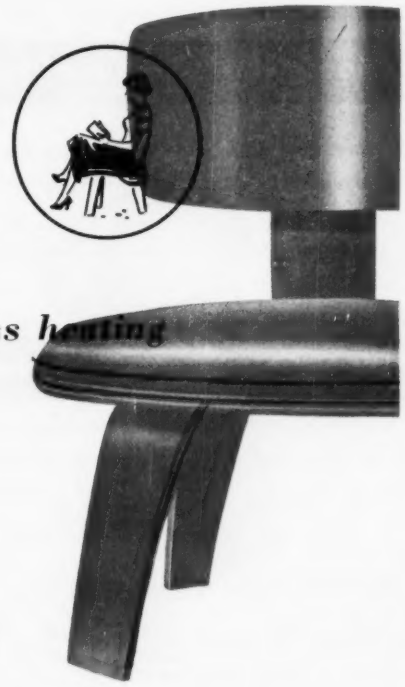
Our expert "know-how" is at your Service! Call us in, without cost or obligation! LAfayette 3-8910.



FOR FORMING

or

LAMINATING



Dowtherm

means accurate control in process heating

Because DOWTHERM heating means precision control, constant temperatures and uniform heat application, it makes possible new processes and new products.

In the plastics industry, DOWTHERM, used in molding plastic and rubber products, has improved product quality and reduced operating costs. Many production methods otherwise impossible can be utilized with DOWTHERM heating.

DOWTHERM speeds the heating cycle and at the same time reduces labor costs. Its outstanding characteristic is the accurate control it affords in obtaining temperatures between 300 and 750°F. at low pressures.

Are you fully acquainted with DOWTHERM's higher operating efficiency? We welcome the opportunity to discuss any process heat problems you may be confronted with. Write to Dept. DM 16.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

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DOWTHERM

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CHEMICALS

INDISPENSABLE TO INDUSTRY AND AGRICULTURE

How to save *most* in assembly

SKIPS TAPPING, AVOIDS INSERTS, MAKES STRONGER FASTENINGS

Timely Toys, Inc. chose P-K Type Z Self-tapping Screws to fasten the metal base plate and mechanism to the polystyrene shell of this popular Turnabout toy car. Screws are driven rapidly with a power driver, and the strong, rigid fastening withstands shock and abuse. Manufacturer says, "No other method would give us the production speed wanted without breakage." Find out how you can make similar savings in time, avoid breakage, and add strength.

Choose the "*short cut*" fastening method

When you make fastenings with Self-tapping Screws, you simply drive them in plain, untapped holes. You avoid tapping for machine screws, inserts in plastics and other assembly-slowing operations like nut-running and riveting. Stripped threads, tap breakage, and parts spoilage are no longer a problem, and your assembly is stronger. But choosing this common sense *method* is only the first step.

Let P-K* fit the fastener to the job

TYPE Z
(also made with Phillips Head)

Only Parker-Kalon offers a complete line of Self-tapping Screws. P-K fits the right fastener to your needs, not your needs to a fastener. Another reason why P-K can help you save most is their 35 year experience as Self-tapping Screw specialists. P-K applications number more than a million, many with savings up to 50% and over.

Find out what you can save. Call in a P-K Assembly Engineer, or send assembly details for recommendation.

Remember, the actual cost of screws depends, never on price, *always* on performance. Specify P-K Self-tapping Screws, and you'll see why the makers of so many of the nation's best-known products say—IF IT'S P-K . . . IT'S O. K.!

Parker-Kalon Corporation, 200 Varick St., New York 14, N. Y. Sold everywhere through accredited Distributors.

NEED SPECIAL SMALL SIZE PHILLIPS HEAD SCREWS?

P-K Type A or Z, in No. 0 or 00 diameter, with a No. 0 Phillips Recess, can be made to order, quantity permitting.

*Trade Marks Reg. U. S. Pat. Off.

P-K TRADE MARK

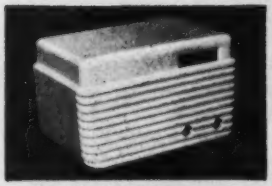
The Original

PARKER-KALON* SELF-TAPPING SCREWS

A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY

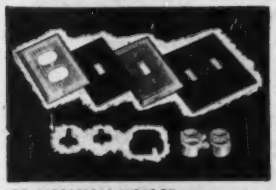
The PEERLESS PLUS

PEERLESS PRODUCES *and* PROTECTS YOUR PRODUCT

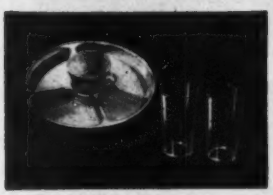


COMPRESSION MOLDED

INJECTION MOLDED

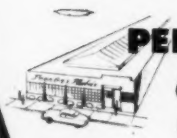


COMPRESSION MOLDED



INJECTION MOLDED

- "THE CUSTOM MOLDERS YOU CAN TRUST"... Peerless integrity in protecting customers' basic ideas has been the fifth factor responsible for its phenomenal growth. This is the Peerless "*plus*", added to the other factors of Engineering Ingenuity, Production Capacity, Product Perfection and Reliable Delivery.
- PEERLESS has the engineering know-how that comes from a variety of experience with a vast variety of products.
- THIS know-how, coupled with superb plant facilities, makes for Peerless leadership, and provides the West with one of the country's outstanding plastic plants.
- PEERLESS has the Capacity! In COMPRESSION and TRANSFER MOLDING—up to **500 tons.** In INJECTION MOLDING—up to **70 ounces** and **700 square inches.**
- PLANT facilities include: Complete mold-making and tooling. Contamination-free raw material storage.
- "PEERLESS CAN TURN IT OUT"—with speed, accuracy and TRUE ECONOMY!

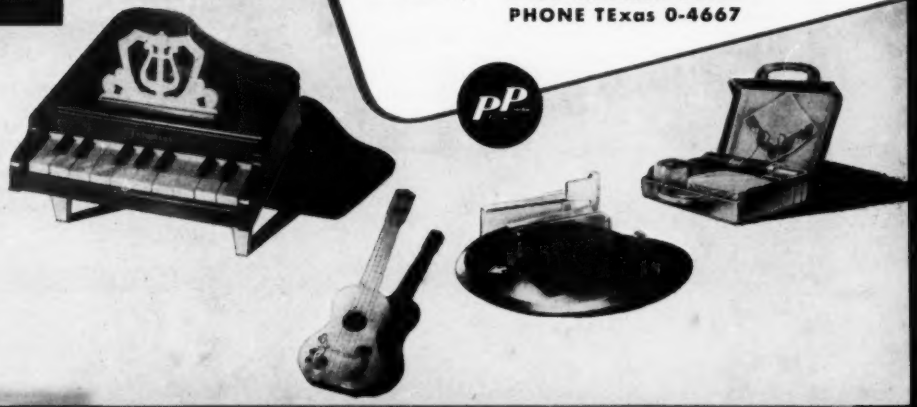


PEERLESS PLASTICS

Culver City, California

8490 WARNER DRIVE

PHONE TExas 0-4667



Out of a specialized experience important to laminators and other industrial users...

PLASTICS

by REYNOLDS METALS COMPANY
World's Largest Producers of Aluminum Foil

Reynolds long experience in packaging, primarily in the application of aluminum foil, has necessarily involved many developments in plastics—both for lamination to foil and as separate materials.

Reynolds pioneering in the entirely different field of aluminum pigment also led directly to plastic uses. It was the development of polychromatic finishes, as for automobiles, that opened the way to aluminum-pigmented plastics—to opaque metallic film.

Reynolds own manufacturing facilities have naturally resulted—with a specialization in tough, fine-mil cast film particularly suitable for lamination and superior for many other industrial uses.

Two types of film are presented here...a general vinyl series and a specialized water-soluble polyvinyl alcohol series. Write for details.

REYNOLDS ALUMINUM

REYNOLDS METALS COMPANY, PLASTICS DIVISION,
19 EAST 47TH ST., NEW YORK, N. Y.

REYNOLON 5000 SERIES— POLYVINYL CHLORIDE

Transparent Mat
Series of Opaque Colors
Series of Pastel Translucent Colors
Series of Opaque Metallics

Forms available	Rolls and sheets (1)
Thickness index, in.	.002" to .004" (1)
Maximum width, in.	54" (1)
Area factor, sq. in./lb.	10,600 (.002") (1)
Specific gravity—approx.	1.26-1.30 (2)
Tensile strength, lb./sq. in.	3000-4000 (1)
Elongation %	270-370 (1)
Tearing strength (Elmendorf) gms.	500-700 (1)
Water absorption (24 hrs. % at 77°F)	Negligible (2)
MVT (gms./100 sq. in./24 hrs./.002" at 95% R.H.	High (2)
Resistance to acids	Good (2)
Resistance to alkalis	Good (2)
Resistance to greases and oils	Good (2)
Resistance to organic solvents	Soluble in Ketones and Esters (2)
Resistance to heat (limiting temp.) °F	Softens at 200°F, melts at 230-295°F
Resistance to sunlight	No effect (2)
Dimensional change at high R.H. %	None (2)
Resistance to storage	No change (2)
Flammability—in./sec.	Self-extinguishing (1)
Taste	None
Odor	None
Toxicity	None (3)
Heat sealing temp. °F	320-340

REYNOLON 4000 SERIES— POLYVINYL ALCOHOL

Forms available	Rolls and sheets (1)
Refractive index	1.49-1.53 (2)
Thickness range, in.	0.001"-0.004" (1)
Maximum width, in.	40" (1)
Area factor, sq. in./lb.	10,000 (.002") (2)
Specific gravity—approx.	1.21-1.31 (2)
Tensile strength, lb./sq. in.	7800-8000 (1)
Elongation %	185-253 (1)
Tearing strength (Elmendorf) gms.	High (1)
Water absorption, % (24 hrs., ⅛")	30 up (2)
Resistance to acids	Swells or dissolves (2)
Resistance to alkalis	Swells or dissolves (2)
Resistance to greases and oils	Excellent (2)
Resistance to organic solvents	Unaffected, extremely resistant (2)
Resistance to sunlight	Excellent (2)
Dimensional change at high R.H. %	
Thermal expansion, 10^5 per °C	7-12 (2)
Resistance to storage	Good* (2)
Flammability—in./sec.	2.0 (1)
Taste	None (2)
Toxicity	None (2)
Odor	None (2)
Heat sealing temp. °F	Below 310 (5 sec. contact)

*(*Affected by high Relative Humidity)*

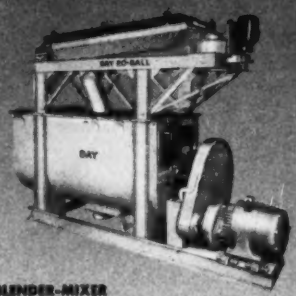
(1) Reynolds data.
(2) Data from printed outside sources.
(3) Special films are available for packaging of fatty products, such as meat, in accordance with the wishes of the Meat Inspection Division of the Department of Agriculture.

DAY *for* MODERN PLASTICS PRODUCTION

For every operation — sifting, mixing, compounding, grinding and dispersing— DAY equipment meets your needs. Every DAY machine is engineered for efficiency, backed by the skills of 60 years' experience. Let your J. H. Day Sales Engineer show you how they cut costs while they boost production. Or write direct for detailed information.

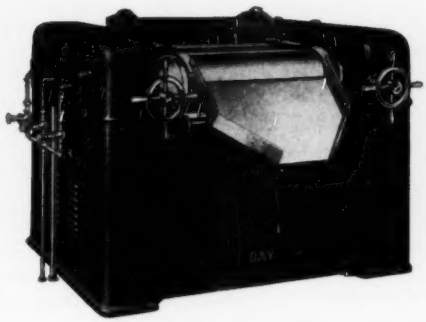
STAINLESS PONY MIXER

One-piece cast head, perfectly balanced for easy tilting. Blade design holds agitator down to working position. Geared head motor, single or two-speed, drives both agitator and can gear; driving mechanism fully enclosed. Five sizes; working capacities from 40 to 125 gallons.



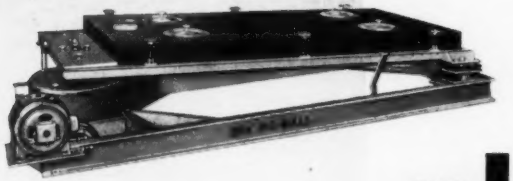
BLENDER-MIXER

Plain or stainless steel construction. Double ribbon agitator insures constant lateral and radial movement. Geared head motor and roller chain drive. Variable height legs. Center or end discharge optional. Range of sizes from four to 3850 gallons. (Illustrated with screening attachment.)



TYPE B THREE-ROLLER MILL

Solid one-piece cast iron frame with ribbed construction for high rigidity. SKF self-aligning roller bearings. Helical cut gears, running in oil, for smooth, quiet operation. High grade electric furnace chilled rolls, independently adjusted. Silent chain drive.



RO-BALL SIFTER

Super-Active ball cleaning device permits use of finer mesh . . . keeps mesh free and open . . . utilizes entire screen surface for peak capacity. Dust-proof inspection ports. Large size slide-type bearings for long life and smooth operation. Self-aligning stabilizers.

THE J. H. DAY COMPANY
INCORPORATED
CINCINNATI 22, OHIO

Molders • Extruders

Can Increase their Profits

Amazing Production Capacity • Thorough One-Pass Compounding

Higher Extrusion Pressures • Super-Fast Purging

Molders, extruders, material manufacturers — in fact, nearly everyone concerned with processing thermoplastics — stand to profit due to the many superior features of the Series 52 Compounder-Extruders.

ADVANTAGES TO MOLDERS

Ownership of a Series 52 Compounder-Extruder assures molders of a constant supply of highest quality, precision injection molding pellets of the exact shade desired . . . whenever they are needed. The compounding and pelletizing of custom colors presents no difficulties to the Compounder-Extruder . . . it can be done as rapidly and as inexpensively as standard colors can. The pellets produced yield the finest in molded products.

ADVANTAGES TO EXTRUDERS

Custom extruders find that the Series 52 Compounder-Extruders produce finished products at the die from basic ingredients fed at the hopper. They obtain perfect dispersion and density in just a *single pass*, thanks to the Compounder-Extruders' unexcelled blending. Tubes, rods, strips and an ever-increasing number of special extrusions are being made.

ADVANTAGES TO MATERIAL MANUFACTURERS

The Compounder-Extruder is the most efficient means of compounding ever devised. It provides a flexible means for supplying customers with quality pelleted materials for molding and extruding. A single unit will do the work of pre-drying ovens, mill rolls, heavy mixers and pelletizers. And the lower cost and higher efficiency of the Compounder-Extruder will be reflected in the down-to-earth prices at which the compounded and pelleted material can be sold.

THESE SERIES 52 IMPROVEMENTS MEAN BETTER PRODUCTS, BIGGER PROFITS

Longer Worms

On all models, worm length has been increased, resulting in kneading and blending characteristics superior to any extruder ever made.

Increased Drive Power

Drive power has been stepped up to a level that meets the requirements for thorough compounding of bulky and highly filled compounds.

Extractor Opening

The barrels on all Series 52 machines are so constructed that vacuum extractor attachments may be readily incorporated to convert them to Compounder-*Extractor*-Extruders. The extractor is used for removal of concentrated moisture and volatiles in the materials being extruded.

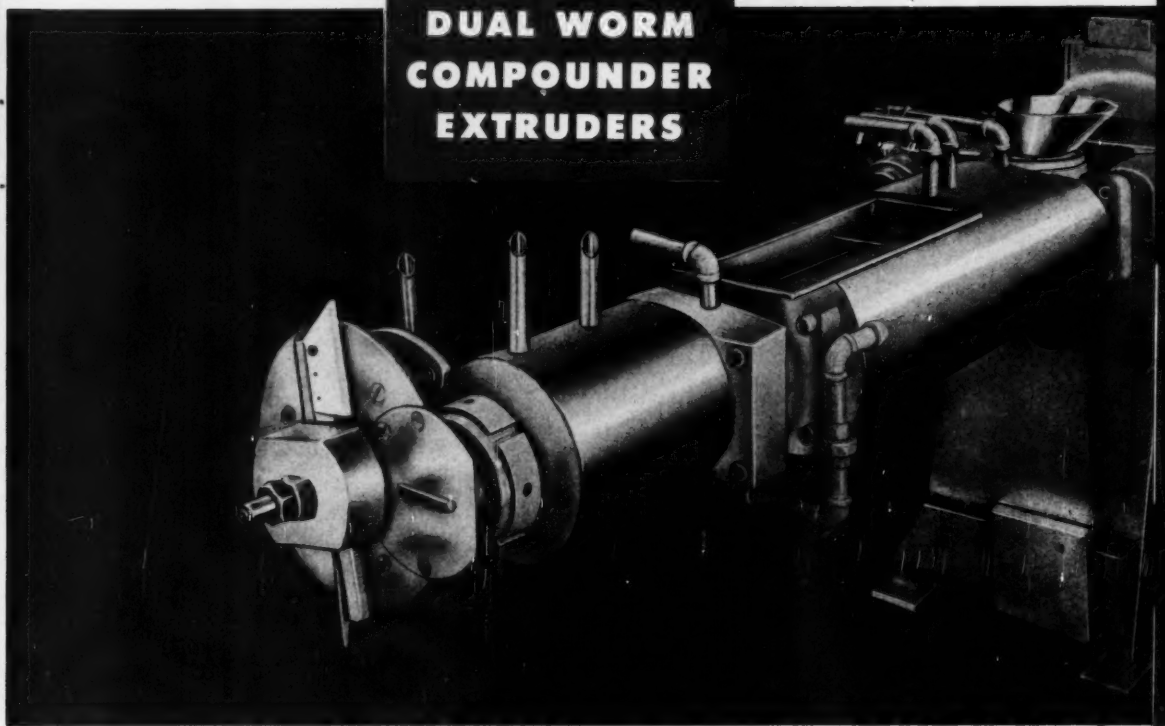
SELECT THE CAPACITY YOU NEED

Compounder-Extruder Model 52	Diameter of Dual Worms (each)	Average Poundage Produced Hourly	Horsepower	These Features Are Common to All
Series 2052	2"	150	12½	multi-zone heating jackets
Series 2852	2¾"	310	25	maximum temperature—650°
Series 3552	3½"	550	50	Torquentrol — continuous indication of mechanical torque with automatic overload cut-out
Series 4552	4½"	1000	100	replaceable barrel liners
Series 6052	6"	2000	200	interchangeable heads and extrusion dies

Material Manufacturers

with the

Series 52
DUAL WORM COMPOUNDER EXTRUDERS



HIGH OUTPUT

Cost analysis reveals that plastic pellets and extrusions made with a Series 52 Compounder-Extruder cost 5¢ to 15¢ less per pound than similar products which are made from compounded, colored and pre-dried resins. Based on a typical thermoplastic feed consisting of basic resins, plasticizers, stabilizers, fillers, colorants and lubricants, the Model 2052 Compounder-Extruder (dual 2″ worms) produces an average of 150 pounds hourly; the Model 3552 (dual 3.5″ worms), up to 600 pounds hourly.

SUPER-FAST PURGING

The rapid clean-out of the Series 52 Compounder-Extruders yields sensational dividends . . . *often enough to pay for the machine within a year!* Average clean-out time is only 15 minutes for a change from deep opaque to crystal clear; for most efficient purging the machine is run at minimum speed and material is fed at both the hopper and open barrel section. Moreover, the material used for flushing is not wasted. It can be re-processed the next time the color being purged is run again.

Welding Engineers will be pleased to have you visit Booth 166 at the National Plastics Exposition. Complete details on the Series 52 Compounder-Extruders will be available.

machinery division
WELDING ENGINEERS, INC.
NORRISTOWN, PENNSYLVANIA

BIG HOUSING PROBLEM LICKED!

Cube Steak Tenderator, manufactured by Cube Steak Machine Company, Needham, Mass.

Heat-resistant styrene... lustrous and durable... cuts housing costs in half, compared with metal! By choosing the correct plastic, by devising a new type of mold construction for this unusually large piece, Prolon Plastics is able to produce a better housing at lower cost. How's your housing problem?

For better quality, better service, write to

PROLON PLASTICS

COMPLETE CUSTOM MOLDING SERVICE

Research • Design • Engineering • Die Making

COMPRESSION AND INJECTION

A Division of Pro-phy-lac-tic Brush Company, Florence, Mass.

COATED PRODUCTS COMMENTS

Designed for Plastic Finishing

Waterproof Cloth Belts are a product by CARBORUNDUM specifically applicable to the wet sanding of plastics, and other ductile materials subject to plastic flow. Most important among their characteristics are a hard and sharp silicon carbide abrasive, a resin bonding agent, and a resin presized wear-resistant cloth.

Customers prefer these belts because they consistently outperform others in doing better work at lower cost. This is a natural result since they are designed to maintain a constant cutting rate throughout the long life of the belt. They cut fast and clean without shedding, gumming-up, or glazing. Another important feature is the fact that these belts are formulated to retard "wet-stretch". Because of this, down-time is reduced for machine and operator in making tensioning adjustments.

Start getting all the benefits from Waterproof Cloth Belts by CARBORUNDUM. Call in your CARBORUNDUM representative. Coated Products Division, The Carborundum Company, Niagara Falls, New York.

COATED ABRASIVES BY

CARBORUNDUM

TRADE MARK

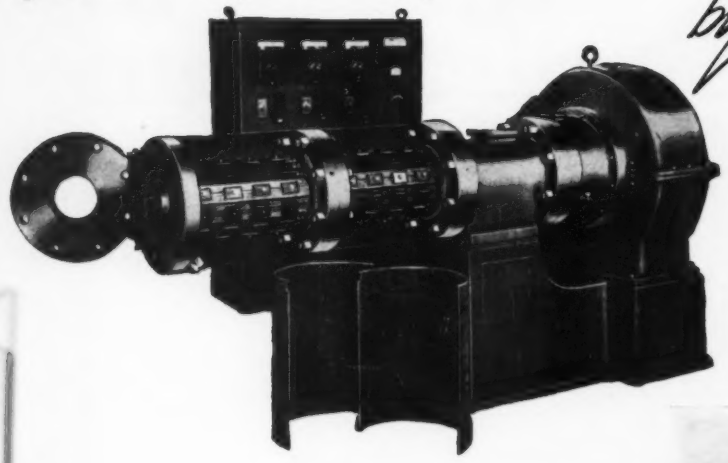
Making ALL abrasive products . . . to give you the proper ONE

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company

Electrically Heated **EXTRUDERS**

for accurate zone heating

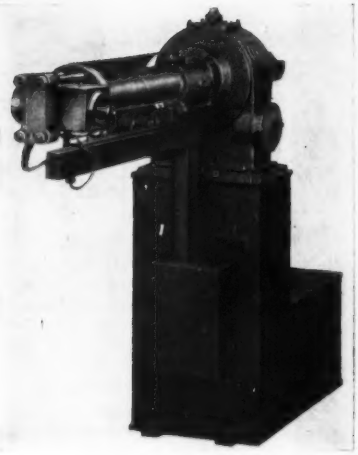
by NE

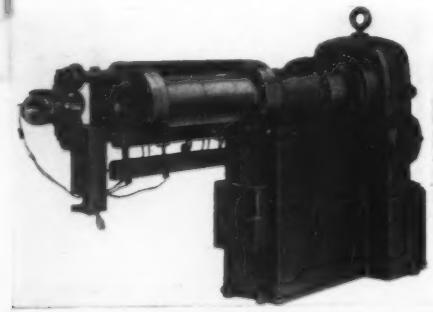


FOR straight line production of higher uniform quality, NE Electrically Heated Extruders enable you to select the correct heat for the thermo plastic compounds being extruded. You can hold the correct heat uniformly along the screw. Close control by zones thus improves the product and reduces the cost.

Above is shown NE 6" Electrically Heated Extruder with flanged head for extruding rods, tubing, sheet materials etc. To the right is the NE 1 1/2" Electrically Heated Extruder with insulating head; and below is the NE 3 1/2" Electrically Heated Extruder with insulating head. These are widely used in applying insulation, or cover, over copper conductors, cord, etc.

Electric panel shown above applies to each machine for accurate zone heat control.





Consult with our engineers on your Plastic Production needs.

NATIONAL ERIE CORPORATION

ERIE, PENNSYLVANIA • U. S. A.

Customers never get moldings like *these* from Norton Laboratories, one of America's great names in custom molding.

Why? Simply because the designers of these pieces have missed the boat . . . The moldings seem to be satisfactory until they're examined carefully: Wall thicknesses are too varied—beware of warpage and distortion; corners that aren't rounded are apt to be weak; inserts aren't anchored properly; parting lines and gate marks should be hidden on edges where they don't show.

On the other hand, plastic assemblies and finished products from Norton are designed properly, by engineers who *know how*.

And the men who tend the Norton compression and injection press *know how*.

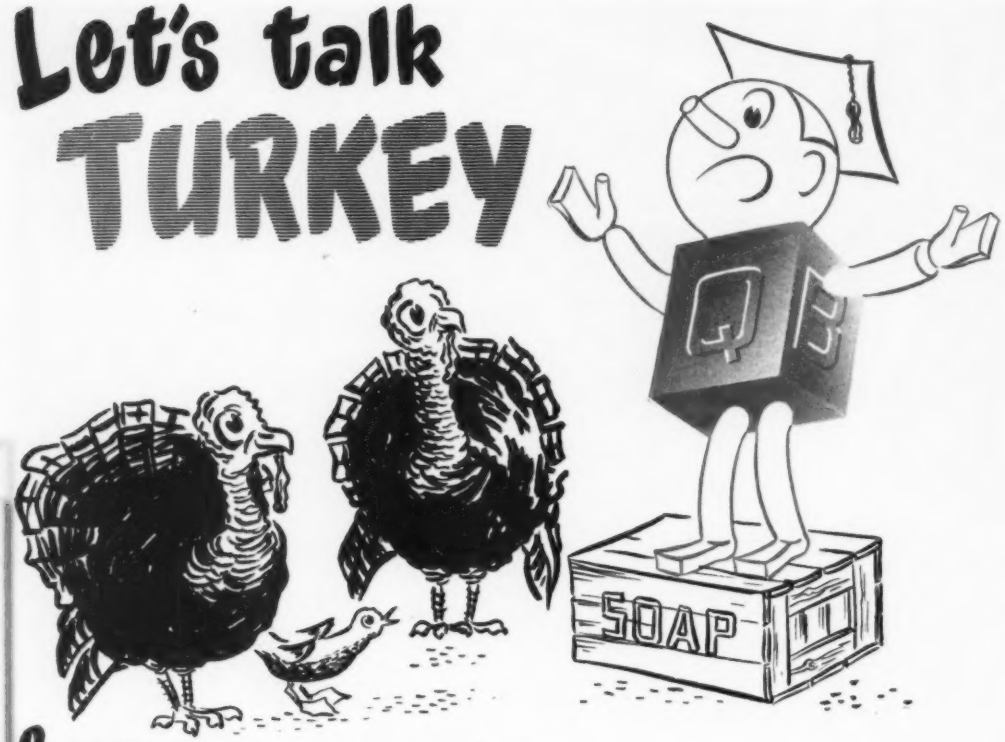
The design skill is yours, the presses are yours . . . if you need plastic moldings designed and molded by men who *know how*.

Put Norton designers to work now, without obligation on your part, on the preliminary spade work for your next molding assignment. Write to us describing the job—we will respond promptly with design recommendations, price estimates and delivery dates . . . Or, if you prefer, ask our nearest sales office to have a Norton *engineer* call on you for a free consultation. Norton Laboratories, Inc., Lockport, N. Y. Sales Offices: *New York—347 Fifth Ave.; Chicago—5221 Kimbark Ave.; Cleveland—4504 Superior Ave.*

NORTON *Laboratories, Inc.*

COMPRESSION AND INJECTION MOLDING

Let's talk TURKEY



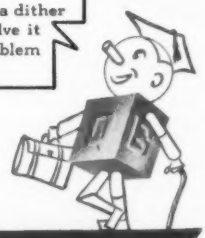
CUBEE wants your business... This advertising which we buy in many trade papers month after month is for one purpose and one purpose only . . . to tell you we want your business.

We can tell at great length of the many facilities we can offer such as designing, die-making, molding, modern production methods and highly trained and experienced craftsmen. Yet it all boils down to suggesting you consult with us early on your plastics problems.

So let's get to the point . . . Let's Talk Turkey. The next time you have a plastics problem, call Cubee. Plastics is his business.

Q-B Says:

"When a plastics problem has you going
And you're really in a dither
There *is* a way to solve it
Simply send your problem hither."



QUINN-BERRY CORP.
2654 West 12th Street
ERIE, PENNSYLVANIA

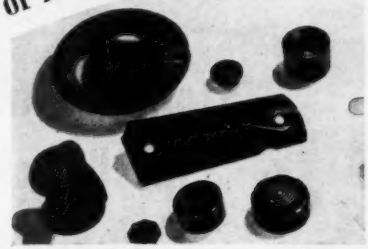
Branch Offices

MR. HARRY R. BRETHEN
11341 Woodward Avenue
Detroit, Michigan
Townsend 8-2577

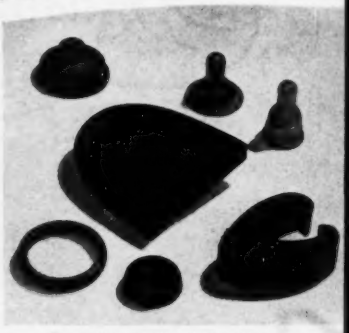
PARAGON SALES COMPANY
111 S. 22nd Street
Philadelphia 3, Pennsylvania

The Latest Edition of THE CARVER LABORATORY PRESS

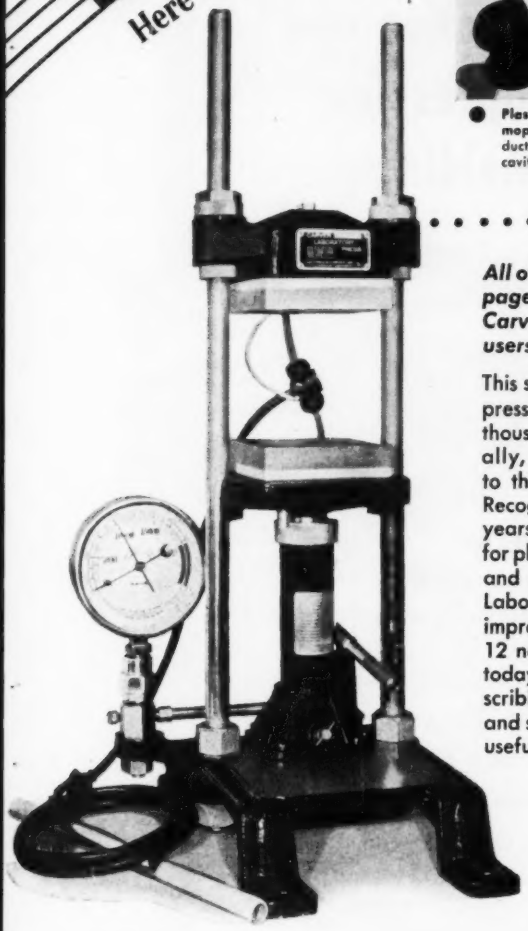
Here Are A Few Results of Research & Development Done on the CLP

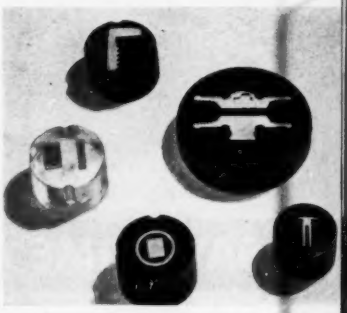


● **Plastic Molding of Thermosetting and Thermoplastic Materials**—Molding samples, production and color control work, testing single cavity molds, etc.

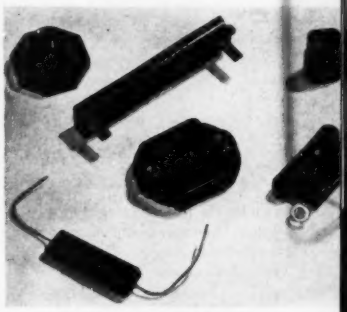


● **Rubber Molding, Vulcanizing, etc.**





● **Mounting Metallographic Specimens**



● **Molded Pieces with Metal Inserts**

All of the items shown on this page were produced on the Carver Laboratory Press by users in the Plastics Industry.

This small, compact laboratory press is called "the press of a thousand and one uses." Actually, no one knows the limit to the number of its services. Recognized for more than 20 years as standard equipment for plastics laboratory research and development, the Carver Laboratory Press is now further improved by the addition of 12 new features. Mail coupon today for Carver Catalog describing these improvements and showing some of the many useful applications.

The Carver Press provides complete range of temperatures from room temperature to 400°F. Adjustable by thermoswitch to within plus or minus 2°F. Equipped with accurate 6" gauge, providing load readings up to 20,000 lbs. Low pressure gauges optional. Carver Standard Accessories include Electric or Steam Hot Plates; Electrically Heated and Water Cooled Hot Plates; Carver Test Cylinders; Swivel Bearing Plates; Cage Equipment, etc.

FRED S. CARVER INC.
HYDRAULIC EQUIPMENT
343 HUDSON ST. NEW YORK 14, N. Y.

Please send Catalog and full information about the Carver Laboratory Press, also a free plastic ash tray molded on the Press.

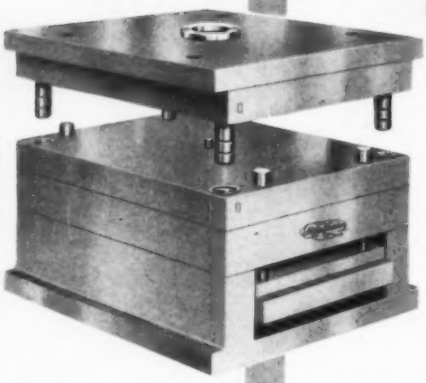
NAME .....

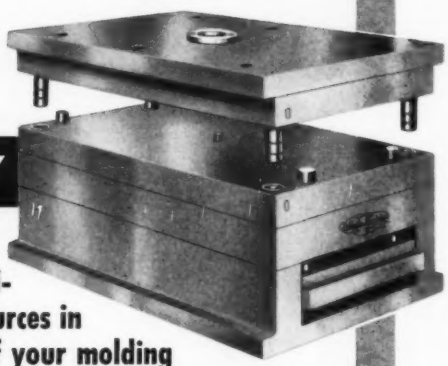
FIRM .....

ADDRESS .....

Master Precision

Standard Mold Bases for Injection and Compression Molding





SAVE TIME AND MONEY

Allows the full utilization of your resources in the development of your molding business—Increases capacity and versatility.

Featuring a wide size range—applicable to practically any platen. Clamp slot types allow maximum piece part area. Special Mold Sets made to customer specifications—cavity plates also available in "Holliday" speed alloy steel. We also make and stock Ejector Pins and a complete line of component parts.

Now Available

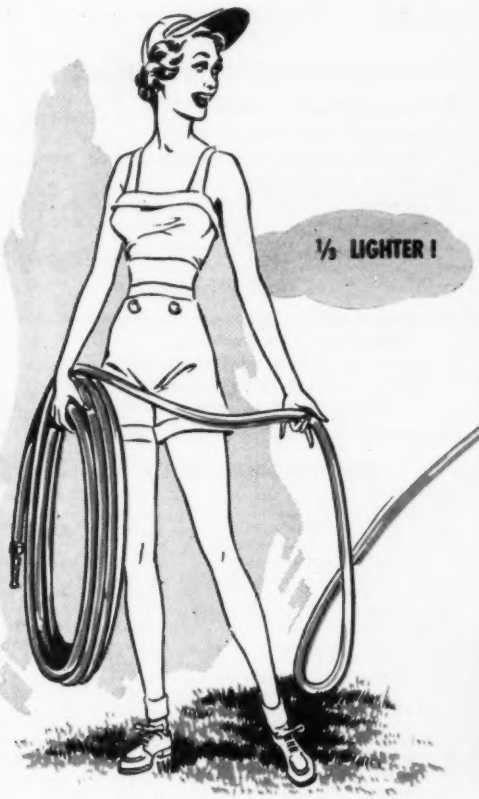
Catalog D-4, containing 108 pages of engineering data, weights and prices — listings and illustrations of our complete and varied line of Standard and Stripper Mold Sets. Complete engineering information and prices of stock components in great selection are also listed in Catalog D-4. Send in for your copy — we will be pleased to send it.

MASTER MACHINE AND TOOL CO.

925 W. NORTH AVENUE • CHICAGO, U.S.A.

Lighter! Cleaner! Longer Lasting!

YARDLEY "TRU-SIZE" PLASTIC *Garden* HOSE



LESS WEIGHT

Tru-Size is one third lighter than old-fashioned hose. Even a child can coil it and carry from front yard to back yard, from garage to garden.

EASIER HANDLING

Kinkproof and crackproof, Tru-Size is made of virgin vinyl with a smooth, semi-gloss finish that won't soil or mark other surfaces.

LONGER LIFE

Tru-Size is backed by a 5-year guarantee against defects in material and workmanship. Will withstand normal water pressures many times over. Couplings of rustproof metal designed specifically for plastic hose. Tru-Size is backed by three years of successful selling.

Made in 25 and 50 ft. lengths. Priced competitively. Regular trade, quantity and cash discounts to accredited distributors.

Write nearest representative or direct.

YARDLEY PLASTICS CO.

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Robert S. Stephens
7720 N. Sheridan Rd.
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Tel: Ambassador 2-1725

James N. Savage Associates
20 Vesey Street
New York, New York
Tel: Barclay 7-7264

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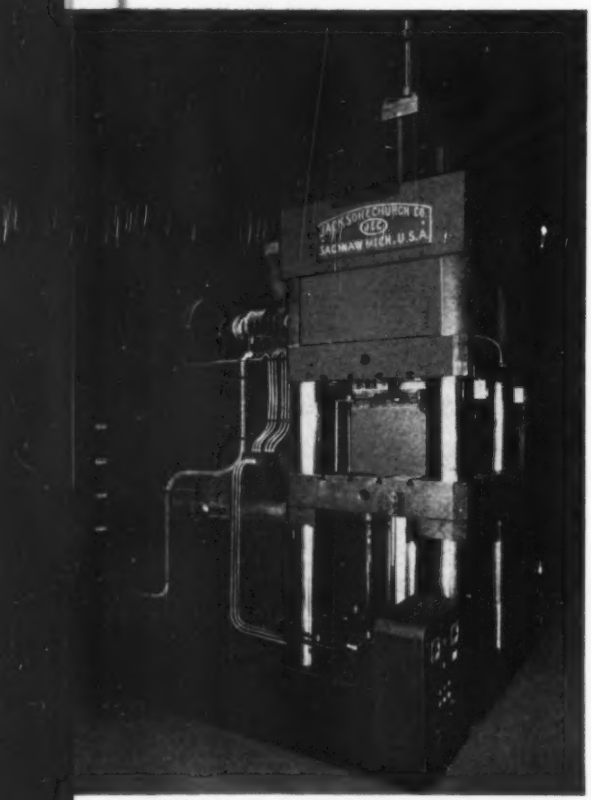
JACKSON & CHURCH
CUSTOMER REPORTS.

COLUMBIA PROTEKTOSITE COMPANY INC. INSTALLS CAPABLE OF 500 SQUARE INCHES

"Our sales outlet," according to the Columbia Protektosite Company, "wanted new items, big items, so we purchased a Jackson & Church pre-plasticizing press with a projected area of 500 square inches. This press has much greater capacity than any of the present machines installed in Columbia. We contemplate making larger items which will weigh up to 58 ounces and we are confident that the increased capacity obtained from the Jackson-Church machine will enable us to satisfy the demands for larger items from customers and sales outlets".

* STATEMENT OF COLUMBIA PROTEKTOSITE COMPANY ON FILE WITH JACKSON & CHURCH CO.



(1) PRE-PLASTICIZING MEMBER

1. Electrically heated member
2. Four zone temperature control
3. Specially designed stainless steel extruder pump
4. Stainless steel hopper
5. Water cooled thrust bearing and leakproof lubricant seals
6. Temperature controlled hopper
7. Standard coupling and gear box for ease of maintenance

ADVANTAGES

1. Insures complete and uniform temperature of plastic at discharge port of this unit
2. Compounds acetate, ethy-cel, vinylite, etc. through mulling action of specially designed extruder pump
   (a) Colors polystyrene, acrylic, through mulling action
3. Capacity on surge basis, 360 lbs. per hour polystyrene

SPECIFICATIONS — 48 OZ. MODEL

Ounces Per Shot	48 oz. (Styrene)
Time Cycle for 48 Oz.	30 Seconds
Total Poundage Per Hour	360 Lbs. (Styrene)
Pressure Per Square Inch on Material in Injection Chamber	10,000 p.s.i. Maximum
Diameter of Plunger	3¼" Diameter
Diameter of Screw	3¼" Diameter
Speed of Screw	25 to 200 r.p.m.
Projected Area	500 Square Inches
Locking Pressure	500 Tons 573 Actual
Stroke of Clamp Cylinder	27 Min. 36 Maximum
Speed of Closing	350 Inches Per Minute Slowed Down to 60 Inches Per Min. for Clamping
Speed of Opening	425 Inches Per Minute Slow Down for Knock-Out
Maximum Overall Height	19'6" to 21'
Maximum Daylight Opening	36" to 64"
Minimum Daylight Opening	0" to 37"
Distance Between Tie Rods	Left to Right 36 Inches Front to Back 36 Inches
Floor Space Required	96 Square Feet
Approximate Weight	60,000 Pounds

AVAILABLE IN 8, 24, 48, 64, AND 80-OZ. MODELS

*Patents Applied For

500 SQUARE INCHES PROJECTED AREA AND 360 LBS. PER HOUR ON 48 OUNCE PRESS

48 OZ. PRE-PLASTICIZING PRESS*

PROJECTED AREA

(2) TROUBLE-FREE INJECTION CHAMBER

1. (a) Eliminates troublesome torpedo
   (b) Electrically heated nozzle ram and chamber
2. Two zone temperature control
3. Co-efficients of thermal-expansion closely controlled
4. Temperature of controlled upper head is to safeguard against expansion of press
5. Yoke clamped to pre-plasticizing member for positive no-leak clamping

ADVANTAGES

1. (a) Elimination of plasticizing in injection chamber
   (b) Results in faster cycles
   (c) Mold is now limiting feature with regard to cycle
2. Injecting thoroughly heated plastic at low pressures into mold
3. Results in strain-free moldings
   (a) Greater projected area possible
4. Elimination of stuck sprues, through specially designed nozzles

(3) DRIVE FOR PRE-PLASTICIZING MEMBER

1. Trouble-free fluid motor
2. Standard proven V-belt and sheave drive
3. Proven gland for temperature control within extruder pump-screw

ADVANTAGES

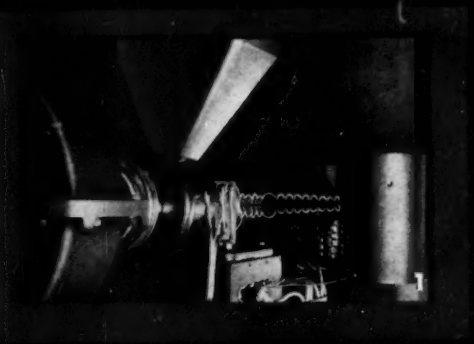
1. Conserves H.P. by using electric motor and pump from hydraulic unit as source of supply for fluid motor
2. Ease of maintenance of fluid motor
3. Relief valve works as brake to insure safety for other moving members
4. Ability to get minute speed variations
5. Ability to stop and start pre-plasticizing unit simply without ill effect
6. Internal heating of extruder pump screw. Results in greater plasticizing efficiency

(4) HYDRAULIC UNIT

1. Self-contained
2. Automatically electrically controlled
3. Standard proven hydraulic equipment
4. All externally piped
5. All pumps vented to tank under no pressure during idle cycle

ADVANTAGES

1. Ease of maintenance (accessibility)
2. Venting pumps results in lower oil temperatures
3. Pressure gauges at all important locations to ease maintenance problems
4. Results in quiet operation
5. Fast operation to insure minimum opening and closing time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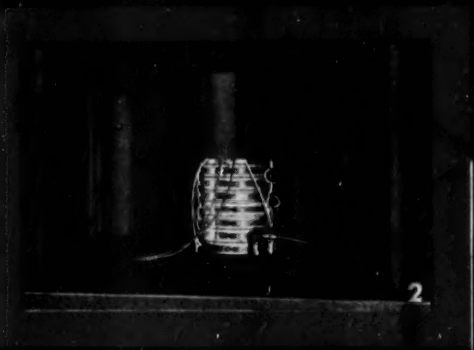
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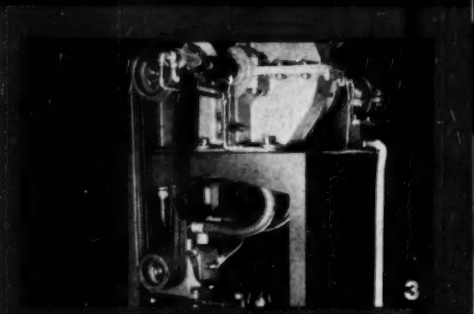
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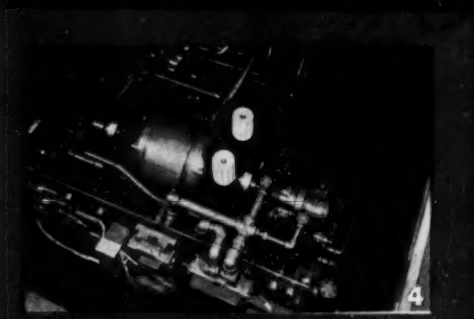
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J-C JACKSON & CHURCH CO.

SAGINAW, MICHIGAN

WORK WELL DONE SINCE '81

LOW COST!
LOW TEMPERATURE FLEXIBILITY!
EMERY PLASTOLEIN 9055
for Vinyls

Unsupported Films, Extrusion Compounds, Organosols, Plastisols

Low in cost . . . Emery Plastolein 9055 (Diethylene glycol dipelargonate) is outstanding for its ability to impart a high degree of flexibility over a wide temperature range *with exceptionally good flexibility at low temperatures!* Yet plasticized films have high tensile strengths and good elongation.

Plastolein 9055 is a stable, light-colored, high-boiling liquid . . . a solvent-type plasticizer which may be used with a wide variety of synthetic resins and rubbers. Get all the facts about this product today! Send for your copy of the Plastolein Products booklet containing specifications and characteristics of Emery Plasticizers, Special Fatty Acids for alkyds, and the new Emery M-461-R Dimer Acid.

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MODERN PLASTICS

VOLUME 27 APRIL 1950 NUMBER 8

PLASTICS BUILD BETTER PRODUCTS AND BETTER VALUES

Command Performance

TO paraphrase Shakespeare, there is a tide in the affairs of industry, which, taken at the flood, leads on to fortune. . .

Now the tide is at flood!

Public appreciation of plastics is at the highest point in history—practical appreciation with no neurotic overglamorization. The respect of all manufacturing industries for plastics as a means to building better products, lower cost products, and/or products that will sell better is keener than ever before. The welcome mat is out for plastics products and components at retail, wholesale, and manufacturing buying offices.

The theme of this issue of MODERN PLASTICS is the same theme as that of the January issue. It is the theme of these times—of the present flood tide. It is but a plain statement of proved fact as witnessed by the case histories presented in January and added to this month at the request of a multitude of readers. It is an end and a beginning: an end to uncertainty as to the net economic result of the industrial uses of plastics, an end to fear of misapplication; a beginning to greater usefulness, greater demand, greater opportunity for plastics.

The same theme has been adopted by S.P.I. as the keynote of the Fourth National Plastics Exposition. Not only will each Exposition display tell its story of quality, economy, and usefulness, but a huge educational exhibit of a hundred or more actual case histories, to prove the point and point up the theme, is being erected by S.P.I. at the show. Here will be the "before and after" display of products and parts once made of other materials, now made more effectively in plastics. Here will be shown the results of increased use of plastics from the standpoint of cost economics, product satisfaction, and sales increase. Here will be the full story behind the phenomenal increase in plastics use in refrigerators, radio and television sets, automobiles, housewares, and other merchandise.

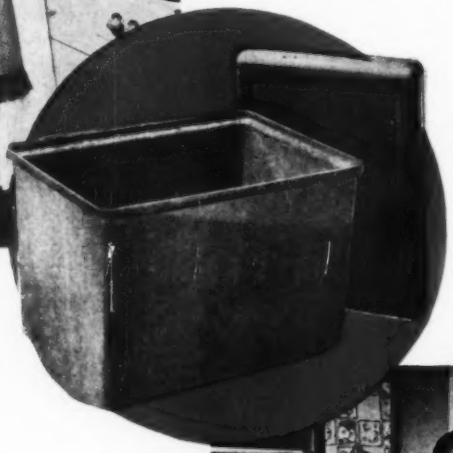
In addition to the Exposition, S.P.I. is offering at the Stevens Hotel, Chicago, a two-morning conference session featuring the finest speakers on sales and distribution ever presented to an industry audience. Addressing this conference will be nationally known distribution authorities, sales executives from the variety chain and department store fields, a marketing and promotion expert, an internationally recognized industrial designer, and a home appliance engineer famed for his practical applications of plastics.

Truly, this is a command—and demand—performance! Never have plastics been so needed as they are today to increase and maintain sales, to lower costs and strengthen values in a highly competitive economy. Never have the people concerned with the production, processing, design, and application of plastics been subject to such pressure of demand on their abilities and ingenuity. Never has there been a greater need for all interested parties to know what has been done, is being done, and can be done with plastics!

Command performance! Chicago, March 28-31. Details of the conference and a preview of the National Plastics Exposition will be found in the insert facing page 122. And beginning overleaf is a further parade of case histories to prove that "Plastics Build Better Products and Better Values."

Good News for Dish Jockeys

Lowest-priced automatic dishwasher has polyester-glass mat tub



PHOTOS COURTESY APEX ELECTRICAL MFG. CO.

Above: Automatic dishwasher in action. Right: Design problem called for tub and lid which would resist attacks by detergents and avoid chipping; solution was to make units of polyester resin filled with performed glass fiber. Below: Tub had to be light weight, needs no finishing

A DISTASTE for dishwashing and a recognition of the fact that previous automatic dishwashers were: a) expensive to buy and b) expensive to install, led Jules La Raus to turn to plastics in designing his All American dishwasher.

The product, the lowest-priced fully automatic dishwasher on the market—priced $100 under its next competitor—is portable and weighs less than 106 lb. in its shipping carton. It is rectangular in shape, 22 in. by 16 in. by 36 in., and the closed top may be used as a work surface. It will wash dishes for a family of five with only 3½ gal. of hot water at ordinary household heating-tank temperature.

In use, the dishwasher is rolled on its oversize casters up to the sink, the dishes are placed in the basket with a spoonful of detergent, the lid is closed, the intake hose is snapped onto the hot water faucet, the drain hose is hung on the sink, the dial is set, and the water is turned on. The unit is independent of faucet pressure; the five motor-powered hydro jets clean plates front and back, glasses and cups inside and out.

Where Plastics Entered

The jet device—based on the principle used to remove scale from steel plate—and the non-clogging rotary pump for washing pressure and tub discharge, represented two big problems; but not as big as the problems of the tub and the lid.

That's where plastics came in.

The tub was rectangular and required a 1-in. radius on corners to permit maximum number of dishes for washing. It could possibly have been drawn out of sheet aluminum, the tools for which would have cost four times the price paid for the tooling for the plastic parts, but the radius at corners would have had to be almost 2 inches. Furthermore, even anodized aluminum would have darkened or mottled under attack by modern dishwashing detergents. The tub also could have

been fabricated from steel and enameled, the bottom drawn, the sides skirted, and the two welded together. But enameled steel could chip; food particles would lodge in even tiny cracks and eventually cause odors to develop.

Polyester Tub and Lid

The lid had to be light. Steel would have been too heavy and aluminum would spring out of shape if twisted in use.

That's where Apex Electrical Mfg. Co., Cleveland, Ohio, came in —to mold the tub and lid out of polyester resin filled with preformed Fiberglas. Mr. La Raus was acquainted with the pioneer work in reinforced plastics done by A. J. Wiltshire at Apex on washing machine parts.[1]

Through use of preform machine and Kirksite positive matching molds, Apex turns out the tub piece for less than it could be fabricated from steel or drawn from aluminum. The tub needs no finishing, the resin being pigmented opaque white. The lid, made the same way, is enameled on the outside for appearance only—to match the decor of the rest of the modern kitchen.

The molded reinforced plastic tub is immune to attack by detergents, cannot rust or stain or crack or chip. It will take a larger dish than the tub in any other household dishwasher on the market.

As to the lid: it is light enough to be lifted by one finger, strong enough for all possible use—and if twisted, will go back to its original shape.

Even the dish racks in this dishwasher involve plastics. They are coated with an organosol made from a Vinylite resin by Wooster Rubber Co., Wooster, Ohio. The alternative material here would be rubber; plastic elastomer was chosen because of color permanence, chemical resistance, and superior cushioning effect on fine crystal and china.

[1] See "Washing Machine Parts," MODERN PLASTICS 26, 126 (July, 1949).

Better Washer Liner Costs Less

Reinforced plastic unit replaces aluminum liner for automatic washing machine. Total cost saving—25 percent

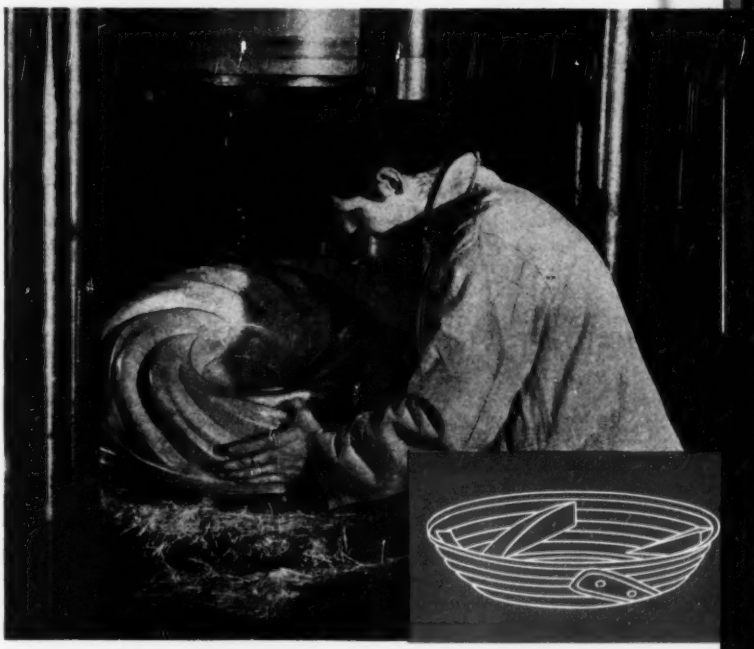
A SAVING in costs of 25% by the use of molded reinforced plastics to replace a metal assembly for a liner in an automatic washing machine is the record of Apex Electrical Mfg. Co., Cleveland, Ohio.

Apex pioneered the use of glass-mat polyester moldings in the home appliance field, being the builder of the now-famous balance ring for the Ward automatic washing machine. That ring, an assembly of 35 parts, proved so successful from a production and cost standpoint and served so well in the field that the company had a background of "know-how" against which to plan the production of this liner for the Apex washer.

The new piece is 21¾ in. in diameter, 3/32 in. thick, and weighs 3.6 pounds. It is molded of No. 150 cut-glass fibers, 1⅞ in. long, preformed, and Selectron No. 5003 resin, the percentage of glass by weight being between 35 and 50 percent.

The plastic unit replaces an assembly of a circular aluminum stamping with four die-cast aluminum ribs bolted in place, plus four embossed plates to support them, plus two rubber sealing gaskets.

In production, the plastic liner



Removing reinforced plastic liner for washing machine from mold. The part is pinch-trimmed by cut-off rings. Mold has heating coils cast into both male and female halves. Inset: Circular metal assembly replaced by plastic liner

Preform screen for collecting glass fibers. Screen, operating here at a 45° angle, is perforated sheet steel fitted and brazed together

preform, heated sufficiently to complete the bonding, is placed in the press in cast Kirksite molds with heating coils cast into both male and female molds. The molds have cut-off rings of oil hardening forged tool steel fitted to the mold, with allowance for differences in expansion of the metals. The rings are fitted with a few thousandths clearance so that they not only pinch trim the part during cure, but retain all the resin.

Assembly Costs Cut

The assembly of the plastic unit cost only 45% of that required for the metal unit. A further saving is in the actual fastening of the liner in place in the washer. For the plastic liner, eight aluminum rivets are used at a cost of 2¢; for the metal job, there were 21 assembly parts. Costs of assembly parts for the plastic unit were 5% of those for the metal unit.

One result of the switch by Apex to reinforced plastics in this liner is the wiping out of difficulties in anchoring the metal ribs to the stamping. A tight fit must be insured so that threads will not get under the ribs and cause damage to clothes. The plastic liner, being in one piece, has no space around the ribs.

Finally, the washing ability of the machine has been improved because of more and larger ribs.

Color Pix That Sell

Full-color photographs, reproduced on rigid vinyl sheet, make mouth-watering food store displays

COLOR transparencies, so real-looking that they whet the appetite, have proved to be effective sales stimulators when used in point-of-sale food displays. The cost of displays built around such pictures can be substantially reduced, thanks to the development of a new process for reproducing full color photographs on rigid Vinylite sheet.

The new process was developed by Wm. Melish Harris, New York, N. Y., who is producing the Vinylite transparencies under the trade name of Plastikolor-Pix. Kodachrome transparencies or other natural color artwork can be reproduced in quantity for less than 1/5 the cost of other transparencies.

Translucent white sheet material 0.010 in. thick is used. Only 40 watts are needed to back-light an 8- by 10-in. Plastikolor-Pix. Moreover, the Plastikolor-Pix appear as color pictures even when not back-lighted. This is a decided advantage over transparencies which appear to be black panels when not.

The method of reproducing Plastikolor-Pix employs no screen and the pictures are not broken down into dots or patterns of any kind. The color pigments are applied simultaneously to both sides of the vinyl sheet by precision machinery.

A vivid example of the savings possible with Plastikolor-Pix is the experience of Frigidaire Div., General Motors Corp. That company was using four three-dimensional transparencies in the superstructure display of its frozen food storage units. The transparencies, purchased in quantity, cost Frigidaire $5.50 each, or $22 per superstructure. When Frigidaire switched to Plastikolor-Pix, the cost went down to $3 for each set of four color transparencies.

In addition to the $19 saved and the "lights out" attractiveness of the vinyl transparencies, the superior light transmission of the vinyl material makes it possible to do an equally effective display job with less light. Whereas the three-dimensional transparencies needed two fluorescent tubes per picture, the Plastikolor-Pix need only one tube each. The consequent elimination of sockets, starters, tubes, and ballast results in an additional saving of $6 per superstructure. Total saving: $25 per unit.

Transparencies reproduced on vinyl sheet are less expensive, more realistic

COURTESY BAKELITE DIV., UNION CARBIDE & CARBON CORP.

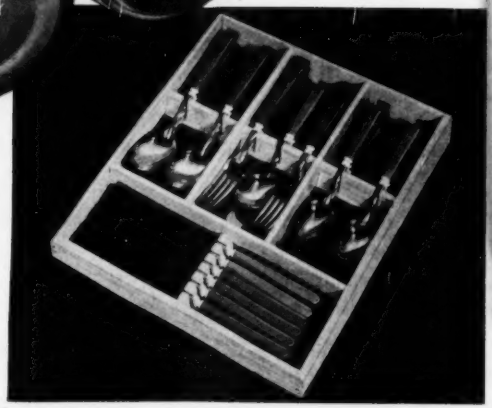
Hardier Handles by Ekco

Why the world's largest manufacturer of housewares has chosen plastics for many kinds of handles

COURTESY HERCULES POWDER CO.

High-acetyl cellulose acetate for kitchen utensil handles stands up well when dipped in boiling water

Phenolic handles on stainless steel pots enhance appearance and value



Acetate handles on kitchenware strike a cheerful color note, upgrade performance

AS the world's largest maker of housewares, which include pots and pans, pressure cookers, kitchen tools and cutlery, Ekco Products Co., Chicago, Ill., uses tremendous quantities of plastics each year. Ekco's gamut of plastic applications includes both thermosetting and thermoplastic materials, ranging from nylon egg beater gears to handles for cookware, kitchen implements, and cutlery.

The company's use of plastics has increased many-fold since the early '30s, when Ekco was among the first manufacturers to specify Catalin and molded phenolic for handles in certain lines.

What They Like Best

Color permanence, non-chipping qualities, freedom of design, and thermal insulating properties are among the things Ekco likes best about plastics. Although the company uses wooden handles extensively in its lower-priced lines, plastic handles are considered important in today's competitive market because they upgrade the appearance and performance of the product, creating better values for the consumer.

In order to meet Ekco's stiff requirements, plastic handles must have the necessary impact resistance and color stability. In addition, the handles must withstand boiling tests before they are accepted. Ekco points out that one of the most severe tests to which such handles are subjected in the home is the drying cycle in automatic dishwashers, where temperatures above the boiling point are frequently encountered.

For its Ekcoline group of kitchen tools, the company first used butyrate and then polystyrene, later settling on high acetyl cellulose acetate as giving the best combination of the desired properties.

Molded phenolic, acetate, and phenolic-impregnated wood (called Flintwood by the company) are widely used as handle materials for

(*Continued on p. 193*)

Molded Smokers Set New Standard

Thermosetting plastics give productive economy, beauty of product, and top-notch quality to the user

SMOKING stands molded entirely of thermosetting plastic bring a new standard of economy, service, and beauty to this type of product, long a stronghold of wood and metal. These new smokers, developed and produced by Van Norman Molding Co., Chicago, Ill., stand approximately 22 in. high and are available with three styles of tops. These include a 10½-in. flat top with raised rim, a recessed model which holds an 8-in. glass ash tray, and a circular top with off-center tray recess which offers extra space for glasses, cigarette packages, etc.

Each stand consists of five sections, including base, top, and three hollow segments which form the stand. The parts are assembled by means of a metal rod which threads into an insert in the top and is secured to the base by means of a hex nut and lock washer. Weight of the stands, exclusive of the glass ash trays, is only about 3 lb.; shipping costs are accordingly low.

COURTESY PLASKON DIV., LIBBEY-OWENS-FORD GLASS CO.

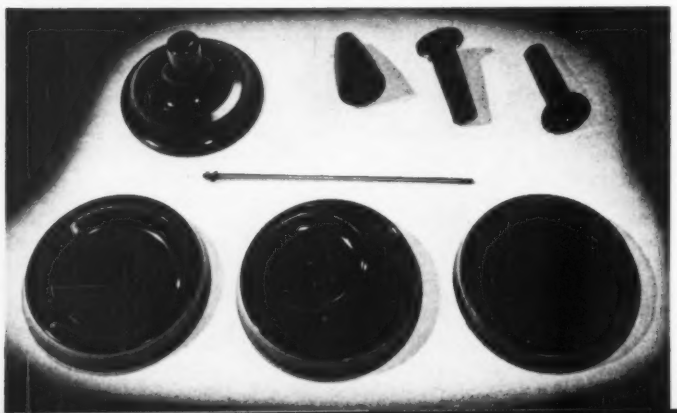
Smoking stands are molded of urea or phenolic—resist cigarette burns and liquor stains. Stand parts can also be used to make attractive lamp (background)

Quickly Assembled

Retailing at from $5.95 to $7.95, the stands are quickly assembled as soon as flash has been removed. Unlike stands of wood or metal, they entail no such operations as turning, drilling, gluing, plating, or application of stains or other surface finishes. The plastic units, impervious to cigarette and liquor stains, scratches, and other normal abuse, may even be used outdoors without fear of rusting, swelling, or other exposure damage.

Keyed to the increased use of color in modern interiors, the plastic stands open up new decorative opportunities. They are molded in Beetle and Plaskon urea and Bakelite and Durez phenolic, offering the purchaser a choice of walnut, oak, bleached mahogany, grey oak, bamboo, dark maple, four pastel colors to match upholstery, and half a dozen light tints to blend with general color schemes.

Five molded parts, assembled by threaded metal rod, comprise smoking stand. Bottom row of mahogany mottle phenolic tops illustrates three types available



The retail cost of the smokers is kept down through the economies of plastic molding, since the molded parts are uniform in dimensions, facilitating rapid assembly, and require no laborious finishing operations. Bases are molded on a 125-ton press, while the tops are produced on a 200-ton unit, and the three stem components are molded on a 50-ton Stokes automatic press.

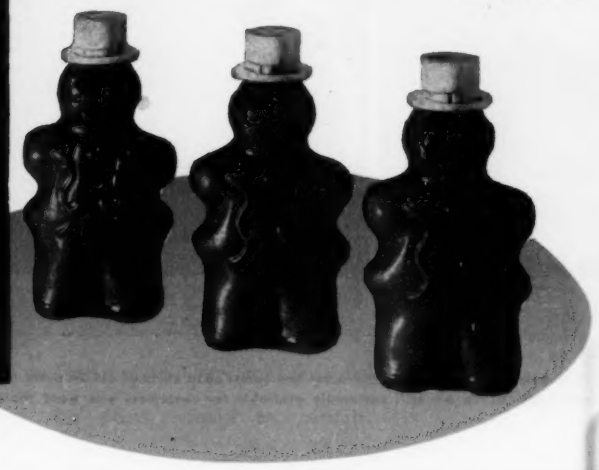
By eliminating the top and one of the stem pieces, and substituting a standard type of socket and shade support, the unit becomes a handsome lamp base.

COURTESY PLAX CORP.

Squeeze bottle for Spray-A-Wave has spray plug and cap molded of white polyethylene by Shaw Insulator Co., Irvington, N. J. Bottle is molded in pink

Designed to appeal to children, the Tussy line of cologne, talcum powder, and liquid bath soap is packaged in polyethylene bottles in the form of gingerbread boys. The bottle plugs are removable

COURTESY PLAX CORP.



The Squeeze Does It

Polyethylene squeeze bottles, more costly than glass, overcome price disadvantages by unique and superior qualities

THE meteoric rise of blow-molded polyethylene squeeze bottles has been one of the most significant plastic developments in the whole packaging field. Today, the bottle is no longer a curiosity—it has joined the ranks of accepted packages.

Just a year ago the only products packaged in polyethylene bottles were industrial chemicals, deodorants, air fresheners, and special preparations. Now the field has grown to include suntan oils, hand lotions, cleansing creams, colognes, perfumes, talcs, and pharmaceutical products.

The entrance of polyethylene into fields where such materials as glass and metal had long dominated was a bold step. However, the superior qualities of the plastic material—non-breakability, which eliminates the costly cardboard protective carton; light weight, which cuts down transportation and handling costs; flexibility, which permits the bottle to be a self-dispensing container; and low permeability—plus all the market research, design study, field testing, and merchandising that has been done in its behalf have made this type of container a good packaging proposition.

Cost Decreases With Large Orders

One of the great limitations of the squeezable bottle is its high cost. Of course, economy depends upon a volume large enough to keep a molding machine running steadily, without loss of time for mold changes. The average cost of a polyethylene bottle is approximately 2½ times that of a comparable glass bottle, but this differential decreases with large lot users and is further reduced by lower shipping and packaging costs.

At first the standard blow-molded bottle was the regular Boston round. This was due to the even wall thickness that can be obtained on a round bottle. Now, however, specially shaped bottles are becoming more common, due to improved engineering and lower mold costs. New designs include a lamp post with a squeezable round top, square bottles with wide-mouth necks, rectangular bottles, spherical bottles, and oval containers. Intricate shapes can also be molded, as evidenced by the Tussy gingerbread boys illustrated above.

An advantage to users of polyethylene bottles is the short time factor involved in producing sample bottles. Today, the trend seems to be toward private-mold shapes. This trend is notable, it is reported, for the squeeze bottle is more attractive and functional when it assumes a flatter, elliptical shape, with curving contours.

Raised Lettering Not Expensive

One of the most outstanding recent developments in the polyethylene-bottle field is the production of raised letters and designs as part of the molding process, thus eliminating the necessity for labeling or printing. For this type of work, of course, special molds are needed. However, the mold cost is not increased by more than a few hundred dollars, even with extensive letter-

COURTESY JULES MONTENIER, INC. COURTESY PLAX CORP.

New polyethylene Stopette container has outstripped sales of old Stopette jar and pads, which are still optionally available for customers who want them

COURTESY PLAX CORP.

Dew uses polystyrene spray and urea cap. Molded-in name eliminates labeling

ing. There are now several examples —Dew, Shulton, Stopette—of this type of work on the market. The bottles carry the trade-name, trademark, slogan, direction for use, contents, name and address of manufacturer, etc. Although the raised letters are of good appearance and easily readable, some packagers "kiss" the lettering with color.

The process used to produce raised lettering can, and has, been extended to the field of container design. All types of design can be embossed and may be used to hide the fill line of air space required in spray containers.

In line with the rise of the squeeze bottle has been the improvement of closures and plugs. The closure and plug is essential to the success of the bottle, for each bottle must be individually engineered in order to obtain the best possible degree of atomizing of the particular product. Standard caps made by many companies can be used on the bottles, since the bottle threads are in accordance with specifications of the Glass Container Manufacturers Institute. For the spray plug, however, polyethylene is almost exclusively used because of its economy, ease of molding, capacity for force fitting, and chemical inertness for all products in the bottle.

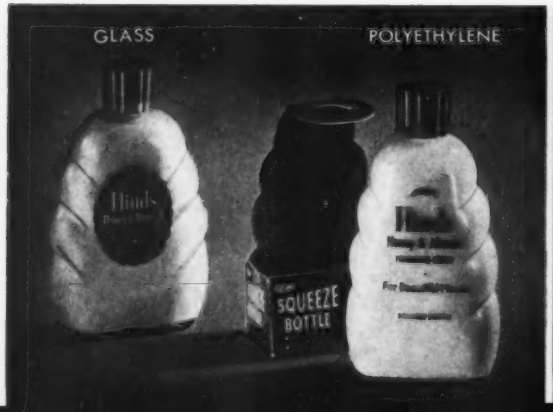
One of the Leaders

One of the best selling polyethylene squeeze bottles, and one which can be duly credited with starting the trend toward private-mold shapes, is the Stopette bottle of Jules Montenier. In July, 1947, when Dr. Montenier, Chicago cosmetic research chemist, first announced his new self-spraying thermoplastic container for Stopette underarm deodorant, he not only started a virtual revolution in the packaging of deodorants and other cosmetics, but he was instrumental in pioneering a vast new market for polyethylene as well.

The Stopette bottle was an inspired idea, but its development was a long time coming. Back in 1938, Dr. Montenier was experimenting on a way to improve upon the Stopette pads as they dried out in time and lost their efficiency until moisture was re-introduced. What was needed was a method of applying the liquid deodorant directly from the container to the skin.

It was at this time that Montenier learned of polyethylene. He then developed an injection-molded bottle, with a heat-sealed bottom. Before the new bottle could be tried,

Hinds Honey & Almond Lotion is now bottled in Plax polyethylene. Mack Molding Co., Inc., Wayne, N. J. supplies polystyrene cap



Polyethylene film envelope seals Spraze squeeze bottle. Closure molded by Shaw Insulator Co., Irvington, N. J.

COURTESY PLAX CORP.

Dr. Montenier heard of a bottle used by the General Chemical Co. for packaging hydrofluroic acid. This bottle, a stock Boston round with a 28-mm. neck, was blow molded of polystyrene by the Plax Corp., Hartford, Conn. Dr. Montenier requested bottles blow molded of polyethylene and then successfully tested them for a year on a non-commercial basis. After having worked out a suitable spray head and closure and being satisfied that polyethylene was the answer to his problem, Montenier designed the special "hand form" 2¼-oz. bottle with 20-mm. neck in which Stopette made its market debut in the summer of 1947. By the end of the year, more than 400,000 bottles had been sold, and Stopette was the sensation of the cosmetics trade.

Since 1947, Stopette sales have risen steadily. In 1949, more than five million bottles were sold, and the company plans to double its sales in 1950. Indications are favorable—January, 1950, sales were 2½ times those of the same month a year ago.

Although the basic design of the bottle, which is vigorously promoted, remains unchanged, the original bottle has been modified slightly to provide increased air space at the

(*Continued on p.* 194)

Injected Squeeze Bottle

New contender in the molded polyethylene container field is injection-molded in two parts, sealed by induction

THE switch of many products from glass to blow-molded polyethylene containers has evoked the interest of the injection molding field. This interest led to experimentation, and today injection-molded bottles with many of the features of blow-molded bottles are on the market. Certain limitations, such as shape and flexibility, are imposed on injection molding, but certain advantages appear also for some applications.

One of the most interesting polyethylene bottles to be produced by the injection-molding process, and one of the more successful ones, is a re-fillable, cone-shaped bottle for Squeez Kleen glass cleaner, a product of the White Rose Chemical Co., Salem, Ore. The bottle is molded and assembled by Beaman Plastic Products Co., Portland, Ore., for the Squeez-Easy Dispenser & Container Co., Salem, Ore., selling agent for the Beaman-made bottles.

Although definite figures are not yet available, it can be assumed that the cost of the polyethylene bottle is at least 2½ times that of a comparable glass bottle. The investment was worthwhile, however, because soon after being placed on a test market, public response indicated the sales success which is in store for this type of container. With only store demonstrations and no advertising, sales of the glass cleaner went up 40% in the first 30 days. By the end of another 30 days, sales had gained by 85%. Soon after advertising had been released and a large display set up at the Oregon State Fair, sales zoomed 200% over the sales figures before use of the polyethylene containers. The company reports that service station operators were its greatest boosters.

One of the great competitive advantages of the Squeez Kleen sales package is its easy re-fill unit. The closure of the polyethylene bottle has a molded-in wrench feature which is used to remove the sealer plug. The bottle has a built-up head with a side orifice for horizontal spraying. A polyethylene tube extends down into the bottle; the head of the tube is inserted in the orifice.

Basically, the bottle consists of an injection-molded upper and lower portion. The whole unit is pressed together with a metal ring in a groove in the base. The unit is then placed in an induction field to seal the parts together. The closure and plug are molded of Plaskon urea, Resinox, and Bakelite phenolic; the bottle of Du Pont polythene and Bakelite polyethylene.

The 6-oz. bottle, which can be shipped full, complying with ICC regulations, weighs 70% less than a comparable glass bottle, thus making possible economies in freight.

COURTESY SQUEEZ-EASY DISPENSER & CONTAINER CO.

Disassembled White Rose glass cleaner spray shows injection-molded polyethylene bottle, bottom, and spray tube. Also illustrated are closure and plug

COURTESY JOS. H. MEYER BROS.

Simulated pearls in necklace and matching bracelet have acetate cores. The beads are made by giving the cores a uniform coating of pearlescence

Bib type necklace at left and necklace matching earring set at center are made of acetate-cored simulated pearls. Necklace and earrings at right are made of enamelled acetate beads

COURTESY CORO, INC.

Beads by the

THE making of plastic beads and bead cores is one of the great examples of mass production in modern industry. About 86 million strands of simulated pearls were sold in the United States in 1949, 80 million of which were on plastic cores. It is estimated that 18 million strings of other beads were sold last year, of which 15 million were plastic. And the market for plastic beads is even stronger thus far in 1950!

The work of making beads involves the extrusion or casting of a plastic rod or small-holed tube, the centerless grinding of that rod into bead cores, the polishing of the cores, the coating of some of them with pearlescence or lacquer, and the stringing of the beads into ropes, graduated strands, or loops. A few million beads have been made by injection molding in a complicated mold with retracting pins to make the holes, but there was no final economy in this method and minute ridges at parting lines created an additional problem.

A variety of types of companies are in the plastic bead business. There are big jewelry manufacturers such as Coro, Inc., New York, N. Y., which buy cores and coat them, string them and sell them under their brand names. There are a few companies exclusively in the pearl bead business. For example Jos. H. Meyer Bros., Brooklyn, N. Y., extrudes rod, grinds the beads, and coats and sells them under the brand name Richelieu. Other companies function at various stages of the process. Tell Mfg. Inc., in Orange, N. J., the world's largest maker of acetate plastic beads, extrudes Lumarith rod (rather, a thick-walled tube) and grinds it, selling the resulting cores to companies that finish and string them. Others work on other plastics materials which will be discussed later in this article.

Advantages of Plastics

Plastics replace chiefly glass, china, and wood in beads, providing more perfect spheres or other forms, lighter weight for comfort, less cutting of string, and longer life of the product. Against unsubsidized competition, the cost of plastic beads is lower.

By far the biggest bead business is in simulated pearls. The natural pearl is made by an oyster building layer upon layer of irridescent nacre around a tiny piece of irritating foreign matter over a period of years. Naturally, pearls are scarce and expensive. A cultivated pearl is made by putting a small ball of mother of pearl into the membrane of a captive oyster, this core acting as the irritating agent around which the oyster builds layers of nacre as in the natural product. Simulated pearls used to be made years ago in Europe by filling hollow glass bubbles with pearly wax; now they are made by dipping alabaster glass or plastic cores again and again in

a solution of pearlescent lacquer.

Max C. Meyer, founder of Jos. H. Meyer Bros., is credited with first commercially coating cores. The material used to coat the cores for simulated pearl beads is a flat crystal extracted from herring scales and carried in a lacquer.

Each maker of simulated pearls has his own secret method of producing the pearlescent coating. This "natural" pearlescence is very expensive, but has not yet been duplicated chemically. There is now on the market, however, a synthetic pearlescence, made by Rona Plastics, Carlstadt, N. J., which sells for a fraction of the cost of the fish scale product and which is used on low-cost beads or as first dip on some medium-priced simulated pearls.

Production Methods

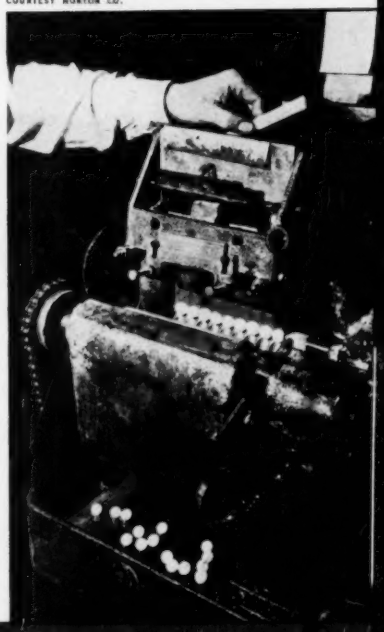
There are two methods of dipping: a) the on-wire horizontal method in which a long string of cores is dipped flat; b) the Richelieu method in which each core is mounted on a toothpick in a flat and dipped vertically, then turned over to let the solution drain back over the bead. Obviously, the heavier and more uniform the pearlescent coating on the final bead, the more effective it is.

The plastic simulated pearl core—almost 100% of these are cellulose acetate—must, like the glass core, be alabaster white in color so as to resemble the mother of pearl core in the cultured pearl. To see why, look closely at any pearl—natural, cultured, or simulated. The whole rainbow is there, broken up in an ever-changing series of patterns as light is refracted through one semi-transparent sheath of pearlescence to the next and so on, to be reflected from the core. A wood core would give a dead look to the pearl bead; a colored core would put a color tinge on it; a crystal clear core would weaken its irridescence. There must be a certain color value and density to the core if light refraction through the pearlized surface is to bring the bead to life.

Simulated pearl beads sell in all

(*Continued on p. 200*)

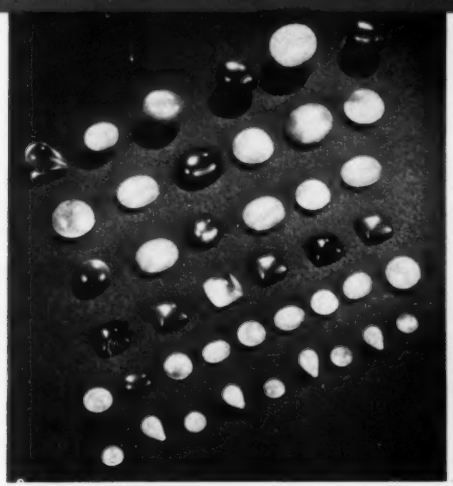
COURTESY NORTON CO.



Centerless grinder produces beads automatically. Rod stock is fed in at top, and the finished beads drop out of bottom of the grinder

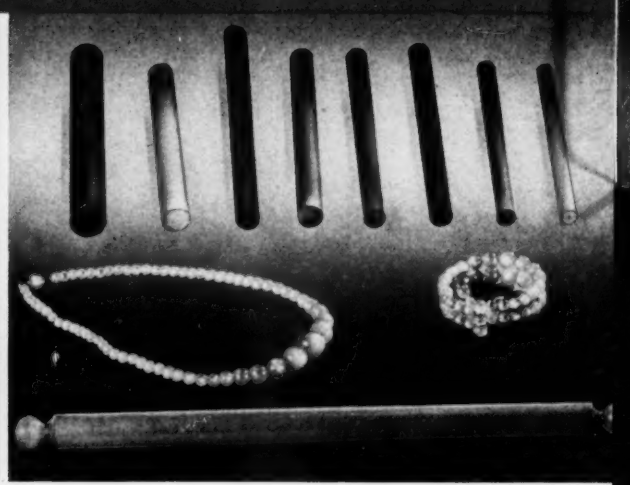
Billions

Plastics — acetate, acrylic, polystyrene, cast phenolic — go into beads selling for from 15¢ to $20 a string



COURTESY ACE PLASTIC CO.

Stones of various shapes, including cabochons, tear drops, and ovals, are fabricated from pearlescent acrylic rod stock. Beads have a "cat's eye" effect

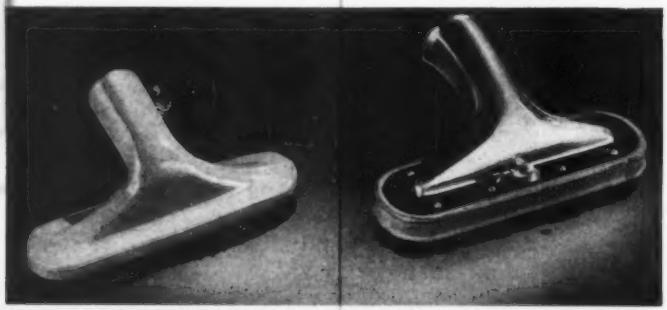


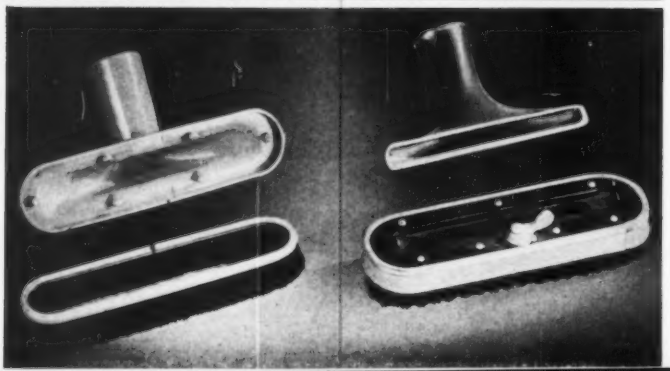
Pearlescent acrylic rod stock (top) is used to produce simulated pearl beads. Ends of rod are first turned on lathe (resulting in the piece shown at bottom) to see if it will produce satisfactory beads

Five Plastics in a Cleaner

The Kirby vacuum cleaner incorporates plastics for lighter weight, greater strength, better appearance, and improved fit of parts

Dirt trap lid is injection molded of polystyrene. The material was chosen because of its color, light weight, and speed of production





Old brush nozzle was a complicated assembly of aluminum, steel, and wood with hairs stapled to it. Ethyl cellulose nozzle is built around metal-backed strip brush

TWENTY years ago, The Scott & Fetzer Co., Cleveland, Ohio, maker of the Kirby Sanitation System, designed the first "crystalator," a device used on a vacuum cleaner to disperse and grind moth crystals. The complicated unit was first made of cellulose nitrate, then compression molded from acetate, and later became one of the first injection-molded parts made by General Industries Co., Elyria, Ohio. It has been redesigned since, but is still produced from cellulose acetate because of that material's resistance to paradichlorobenzene and its impact strength.

Over the past two decades, the Kirby cleaner has undergone several design changes and engineering improvements, each one embracing the use of more plastics components. Lighter weight, increased strength, improved appearance, and better fitting in assembly were the requirements in most cases.

Prior to 1940, the Kirby brush nozzle was made of a wood back with tufted hairs stapled into it, a stamped steel attachment piece, and an aluminum die casting. The postwar shortage of wood led to redesign for plastics—with notable improvement and economy. It was decided to use a length of Fuller metal-back strip brush; accordingly, a suitable holder was designed in Ethocel.

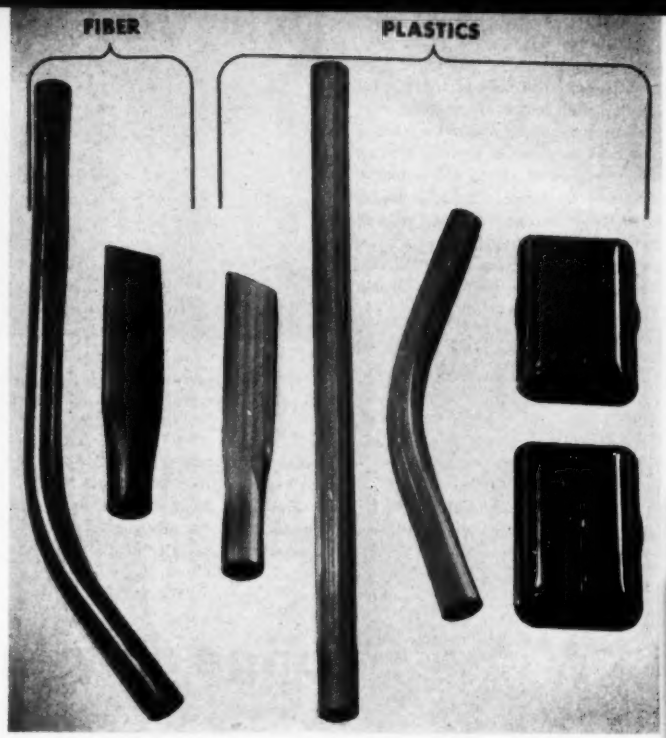
The method of anchoring the strip brush in the plastic is interesting. Six cylindrical plastic lugs are deformed against the side of the metal back by a punch press at room temperature, taking advantage of the flexural and impact strength of the plastic. The new unit, molded by General Industries Co., weighs less

than half as much as the old part.

The former vulcanized fiber extension tubes, both straight and curved, and the radiator tool, have been replaced by Ethocel units made by Yardley Plastics Co., Columbus, Ohio, and Carter Products Corp., Cleveland. Using a material formulated especially for this job, Yardley and Carter extrude the tubing (heavily ribbed on the outside for additional strength and to resist slipping), and swedge it into shape in a heat postforming operation. About 11½ oz. of this extrusion is used in each Kirby cleaner, and the sales force is enthusiastic over the better taper fits, improved finish, and dimensional stability.

Kirby has in one part switched from one plastic to another. To cut weight from 4.35 oz. to 3.55 oz., get a preferred color, and obtain increased production speed, the dirt

(*Continued on p.* 204)



Extension tubes formerly made of vulcanized fiber are now ethyl cellulose. Dust lid is polystyrene

Hats for Horticulture

Butyrate and polystyrene plant caps, costing several times as much as paper caps, show economy through long life and lower labor costs

TO AID agriculturists and home gardeners in promoting germination of seeds, speeding growth of plants, and protecting plants from frost, transparent caps of cellulose acetate butyrate and polystyrene are now being manufactured to replace commonly used paper caps. It has been estimated that the average plastic cap can be re-used for at least five years, as compared to the required use of two paper caps per plant per year.

Labor Savings Effected

The butyrate plant caps are produced by the General Plastics Corp., Marion, Ind. Known as Raydomes, one model of the Tenite II caps costs 25¢ apiece, as compared to 2¾¢ each for the paper caps. However, the plastic caps not only have a much longer life but they can be installed many times faster than the paper ones, thus effecting labor savings on installation.

Field tests indicate that seeds mature six to eight days earlier when planted under the plastic caps than they did under the paper caps. The faster growth is credited to the fact that the temperature is approximately 15° higher under the butyrate cap.

Easily tipped for weeding or for ventilation, the plastic caps are installed by setting them in place and covering their flanges with soil to hold them down.

Trade-named Hotouse, the polystyrene caps are molded of Lustrex by the Plas-Tex Corp., Los Angeles,

COURTESY TENNESSEE EASTMAN CORP.

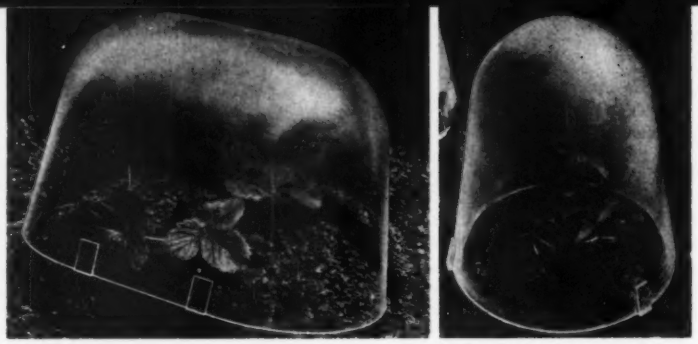
Seeds are said to mature earlier when planted under butyrate caps

Calif. Again, the cost of the plastic cap is much more than the paper ones they replaced. However, when used on a large scale, annual savings are estimated at $30 to $50 per acre in labor costs alone. This, plus faster maturity of the plants gained through the transparency of the plastic, plus the long life of the plastic caps, more than compensates for the high first cost.

One-day Job in 30 Minutes

Initial trials on the Hotouse plant protectors were run at the Calexico, Calif., farm of the Farley Fruit Company. Seeds planted in 500 hills and covered with the polystyrene bowls resulted in a 100% yield. Further tests indicated that one man, using a low cart drawn by a small garden type tractor, could install 500 caps in 30 min.—normally an all-day job with paper caps.

Both of these plastic caps are made in several sizes. In addition to the advantages already listed, their transparency permits observation of plant growth without removing the cap. Here again is a case where only a plastic material could do the best job at reasonable cost!



PHOTOS COURTESY MONSANTO CHEMICAL CO.

Transparency of molded polystyrene plant caps permits observation of plant growth without removing caps. Plastic caps last much longer than paper ones

Vinyl Sponge Replaces Lung

Body contours, frequently distorted after lung-collapsing operations, are retained by filling cavity with sponge plastic

IN certain surgical treatments for tuberculosis it is necessary to collapse a lung and hold it in a state of collapse. For two years, Dr. Allan Hurst, Director of the National Jewish Hospital, Denver, Col., has been working on the project of filling the space in the chest cavity above the collapsed lung with some type of sponge elastic material.

Using a specially formulated white vinyl chloride sponge material developed by Nomad Development and Research Co., Denver, Dr. Hurst has accomplished his project. Patients in which the sponge has been used are doing well, and their chests have natural shape instead of being concave on one side as was formerly one result of such operations.

X-ray photo shows vinyl sponge material in place in patient's chest

COURTESY NATIONAL JEWISH HOSPITAL

Plastic is Non-Toxic

From a medical standpoint, the material resulted from month after month of experiments and testing on different types of animals in the laboratory to assure that resins and plasticizers and stabilizers used would be absolutely non-toxic within an animal body cavity.

From a plastics development standpoint, many combinations had to be tried and tried again before the final sponge was proved out. In this material, a Geon vinyl chloride paste is used with V-I-N stabilizer provided by Advanced Solvents and Chemicals Corp., and B-16 Santicizer plasticizer from Monsanto.

In use, the sponge is shaped to fit the chest cavity space, is washed out in Zephiran and soaked in a Zephiran solution for 48 hr., then washed in a saline solution and placed in position in sterile condition. Open cells of the vinyl sponge come in contact with the cavity walls and the tissues of the walls grow into the sponge cells, literally growing a chest around the plastic.

The sponge material is soft as flesh, about the same weight as lung tissue, odorless, tasteless, non-irritating, and permanent. Cell size and density may be varied, if necessary, in the formulation.

Larry Heightshoe, head of Nomad, reports that experiments are continuing with a variety of plastics in sponge form for various anatomical repair jobs. Vinyl copolymers and polyvinyl alcohols are among those being studied.

Further work is being done on the surgical side by Dr. Hurst. The problem of substitutes for human tissue is so big and complex that research in the field is a lifetime project.

Nylon Stands the Gaff

When molded of nylon, parts for textile machinery have long life, freedom from trouble, low cost, high economy

MANY of the parts used in textile machinery move at high speeds. Therefore, they have to be made with precision, and many of them wear out in a short time. For both these reasons, such parts are often expensive. They also have to be lubricated, which means machine down-time. Moreover, the oil used often contaminates the cloth or yarn. This spoilage is an important problem in many textile plants.

The initial cost of such parts can often be reduced and the problem of oil spots eliminated by the use of molded nylon. As a result, nylon is replacing special hardwoods, metals, and other materials in many parts of textile machinery.

The textile machinery applications of nylon to date fall into four classifications: 1) spindle parts; 2) loom bearings; 3) drafting equipment; and 4) thread guide parts. Bobbins and nylon bolsters, the two specific applications considered in this article by way of example, are both spindle parts. But the reasons for the use of nylon in bobbin parts and bolsters are typical of the advantages of nylon in other textile machinery parts.

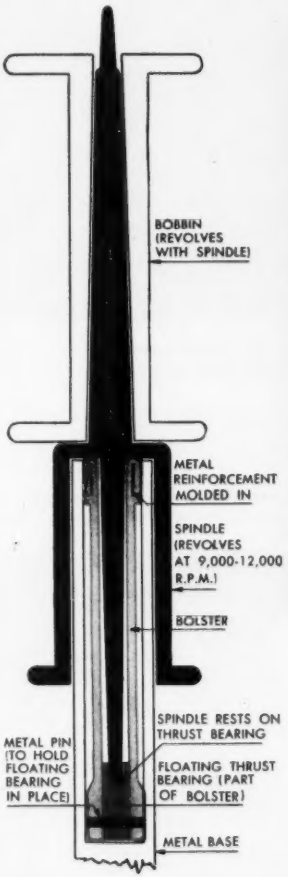

BOBBIN (REVOLVES WITH SPINDLE)
METAL REINFORCEMENT MOLDED IN
SPINDLE (REVOLVES AT 9,000-12,000 R.P.M.)
BOLSTER
SPINDLE RESTS ON THRUST BEARING
METAL PIN (TO HOLD FLOATING BEARING IN PLACE)
FLOATING THRUST BEARING (PART OF BOLSTER)
METAL BASE

Diagram shows how bobbin spindle rests on floating thrust bearing in the bottom of the nylon bolster

Nylon bolster has floating bearing in bottom held in place by metal pin. Holes in bolster allow lubricating oil to circulate freely

Bobbin Parts

Six nylon parts, molded by Minnesota Plastics Corp., St. Paul, Minn., are used in the new Acropak twisting bobbin made by Acrometal Products, Inc. Div. of U S Bobbin & Shuttle Co., Lawrence, Mass. The manufacturer claims that the new nylon and aluminum bobbins are virtually indestructible in normal use and thus greatly reduce bobbin costs per year.

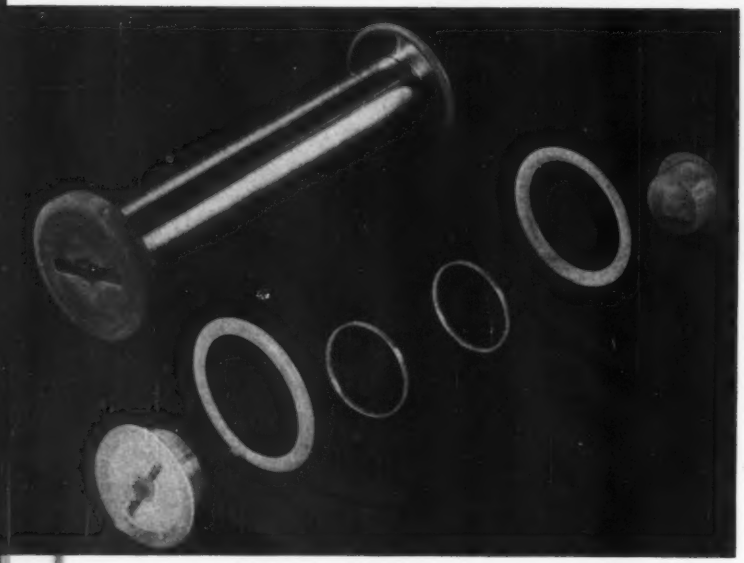
One of the problems solved by nylon is that of nicked flange rims caused by rough handling. For example, bobbins are often thrown down chutes in the mill after being unloaded. With all-metal bobbins, this often results in nicked edges which are likely to catch the yarn. The Acropak bobbin has two nylon rims which snap-fit over the metal flanges. The nylon rims resist nicking and reduce yarn drag.

The Acropak bobbin also has nylon bearings at each end. These molded bearings eliminate much of the wear which resulted when metal bearings were used. They absorb shocks, retain an accurate fit, and cannot freeze on the spindle.

Molded nylon compression rings are also set in grooves near each end of the bobbin barrel. The nylon rings are resilient enough to compensate for contraction or expansion of the metal barrel caused by temperature changes or resulting from yarn tension.

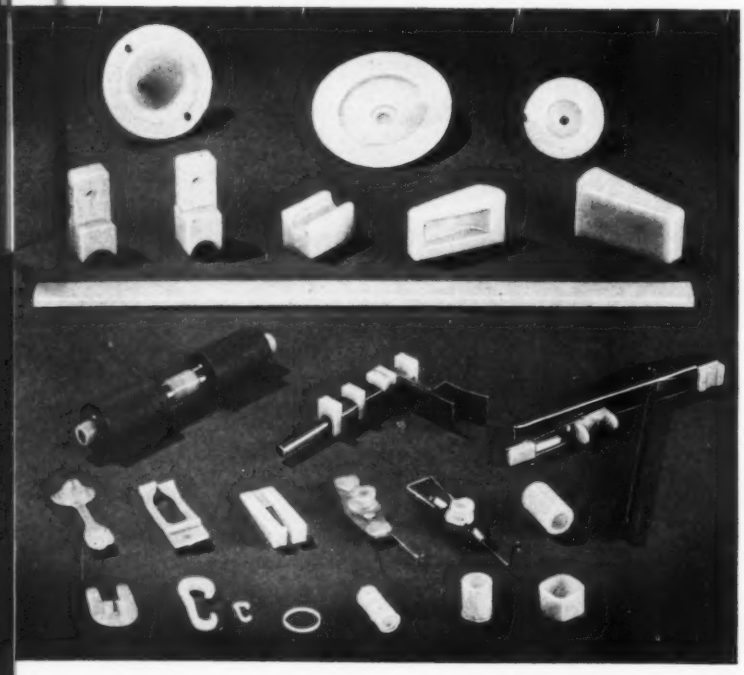
All six of the nylon parts used in the Acropak bobbin are snap-fitted into place when the bobbin is assembled. The Acropak bobbin not only wears longer than an all-metal bobbin, but costs less to buy.

One of the toughest bearing problems in all textile machinery is



New twisting bobbin has aluminum body and six nylon parts: top and bottom bearings, two flange rims, and two expansion rings set into the bobbin barrel

Molded nylon parts are used in textile machinery in various applications, including parallel blocks, thread guides, flyer blocks, and bearings of all types



the one posed by the necessity of providing a bearing for bobbin spindles to turn on. The spindle, usually made of hardened and ground steel, revolves at speeds as high as 12,000 r.p.m. and rests on the bearing with a load of ½ to 5 pounds.

Bearings of varying designs have been used to do this job. Because of the high speeds involved, cast iron bearings required lubrication frequently and wore out quickly. When they wore, they allowed oil to leak out and pollute the yarn.

The latest solution to the problem is a molded nylon bolster made by Machinecraft, Inc., Whitman, Mass. The bolster is a tube-like piece 4⅞ in. long with an inside diameter of ⅜ in. and thicker wall sections at top and bottom than in the middle. A thrust bearing about 1 in. long fits in the bottom of the bolster and is held in place by a pin which goes through the bearing and through both walls of the bolster. The spindle shaft rests on this thrust bearing.

The nylon bolster, unlike most nylon bearings, runs in oil, and the oil circulates through holes in the bolster walls. But the fact that the nylon bolster does not wear out as rapidly as the cast iron bolster greatly reduces oil leakage and lubrication frequency. Cast iron bolsters normally require lubrication after 40 to 120 hr. of operation. Nylon bolsters require lubrication only every 1560 hours.

The saving *in the costs of the oiling alone* will amortize the cost of a nylon bolster in about a year. The nylon bolster also saves up to 15% of the horsepower input per spindle. This is in addition to the savings which result from the elimination of contamination from leaking oil, the reduction in the amount of inspection required, and other unmeasurable collateral savings.

One of the latter important savings results from the simplification of the task of cleaning under the frames. This is usually a complicated wiping job because of the oil mist which is deposited on the surfaces in this area. When these surfaces are dry, as they are when nylon bolsters are used, the accumulated lint can be quickly and easily blown off with an air gun.

Sealed-In Proof

Rust-inhibiting qualities of new gasoline dramatically demonstrated by compression-molded acrylic embedment

A MAJOR merchandising problem confronted Sinclair Refining Co. It was preparing to introduce a new fuel—featuring RD-119, a rust inhibitor—but the problem was to prove to consumers that the new gasoline halts rust and corrosion.

Sinclair had cut identical steel coupons (each 1½ by ½ in.) and had soaked half of them for 48 hr. in gasoline containing RD-119 and the other half for an equal period in ordinary gasoline. The coupons soaked in ordinary gas came out covered with rust. The ones soaked in the new Sinclair gas came out as clean as they went in. This was convincing proof—but having the proof and showing it to the consumer were two different things.

If a set of two sample coupons were mounted on a card, or displayed in any way which allowed the air to get at them, the clean coupon soon rusted or corroded, thus destroying the impact of the sales message.

The problem was solved for Sinclair by Creative Plastics Corp., New York, N. Y., by embedding each set of coupons in a solid block of transparent material.

Molded In Acrylic

Creative had recently developed a process for compression molding objects into clear acrylic.[1] Using this method, Creative was able to mold into a transparent acrylic block, measuring 6⅛ by 2⅜ by ½ in., a set of two coupons and a white card on which was printed a three-color message explaining the significance of the coupon.

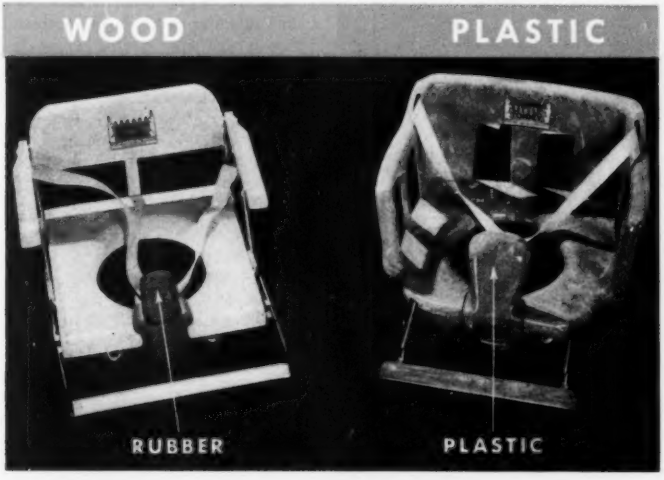
Once they are molded into the acrylic piece, the metal coupons are safe from air, moisture, or any other influences which might change their appearance. But they are "open for inspection" at all times. The result is a convincing display which can be carried in the service station attendant's pocket.

Clean and corroded pieces of steel are molded into clear acrylic block

[1] "Embedded by Compression Molding." MODERN PLASTICS 27, 88 (Oct. 1949).

Junior Gets A Choice

One company, producing children's toilet seats in butyrate and wood, finds many advantages in plastics

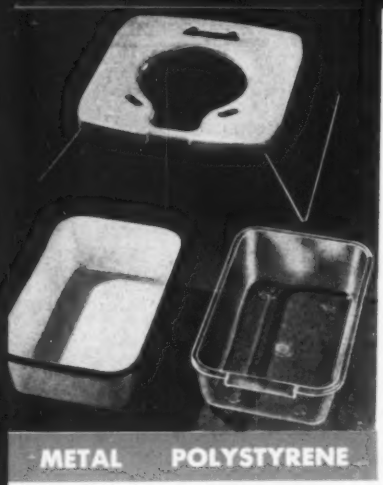


AN ideal opportunity to compare a plastic product with a non-plastic one is offered when a single manufacturer is producing both products for the same market at the same time—and at the same price.

Such a case is the Little Toidey, a child's toilet seat made by The Toidey Co., Fort Wayne, Ind. The company has been making a wooden seat for years and has been producing a plastic version of the seat since 1947, while continuing to produce the wooden seat for those customers who prefer wood.

The plastic version of the seat is

Wooden seat and molded butyrate seat sell for same price. One deflector is rubber, one butyrate



Polystyrene has replaced metal for pan used under base of child's seat

molded of Tenite II cellulose acetate butyrate by Amos Molded Plastics, Edinburg, Ind. It is interesting to note how the qualities of the material and the design features made possible by the moldability of the material result in a better seat at the same cost.

Plastic is Sanitary

Perhaps the most important advantage of the plastic Little Toidey lies in its sanitary features. The plastic material itself is more resistant to uric acid and more easily washable. In addition, the one-piece construction of the seat, arms, and back eliminates all crevices, joints, nuts, and bolts on the parts which touch the baby.

A further sanitary feature of the plastic seat is the fact that the strap can be completely removed for cleaning whereas the strap on the wooden Little Toidey is permanently attached.

All of the hardware is assembled to the underside of the molded seat. This keeps the hardware clean and also keeps the mechanism for adjusting the footrest out of the baby's reach. Thus there is no danger of pinched fingers or other injuries.

The Little Toidey in wood weighs 4 lb.; the butyrate version weighs 2 pounds. This makes it easier for the mother to handle the seat both at home and while travelling. It also makes the plastic seat easier for a child to handle during the two pre-school years when he

(*Continued on p. 206*)

Ukuleles Go Plastic

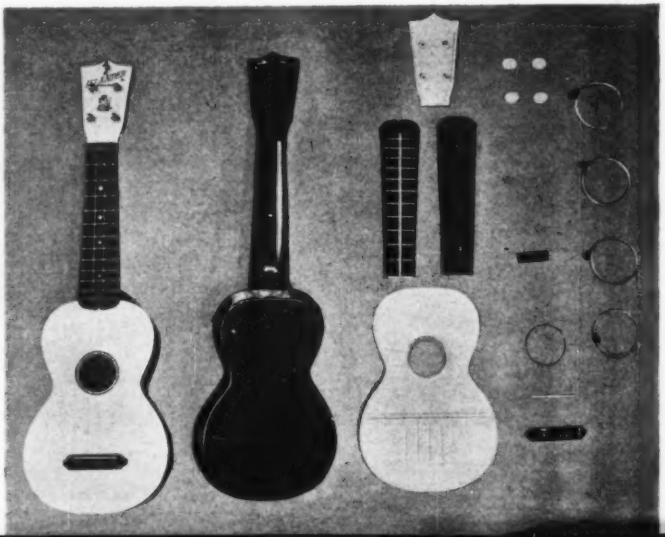
Ukuleles, all polystyrene except the nylon strings, sell in low price bracket, have powerful, mellow tone

THE ukulele, once the rage of the roaring '20s, has come back into popularity in the last two years.

From the beginning, the ukulele, like most other stringed instruments, has been made of wood. Now, however, plastics have entered the stringed instrument field and have made such large inroads that they promise to capture a lion's share of the ukulele market.

The all-plastic "uke," which has been put on the market after several years of experimentation and research, is the brain-child of Mario Maccaferri of the French American Reed Mfg. Co., New York, N. Y. The uke is molded of Dow Styron polystyrene by Mastro Plastics Corp., New York, N. Y., a Maccaferri-owned company. Another use of plastics in this ukulele, which is marketed under the trade-name of the Islander, is the use of Du Pont nylon strings, supplied by the National Musical String Co., New Brunswick, N. J.

Polystyrene ukulele is tuned, played, and tested before leaving plant



Plastic uke's 8 major parts make possible assembly-line economies

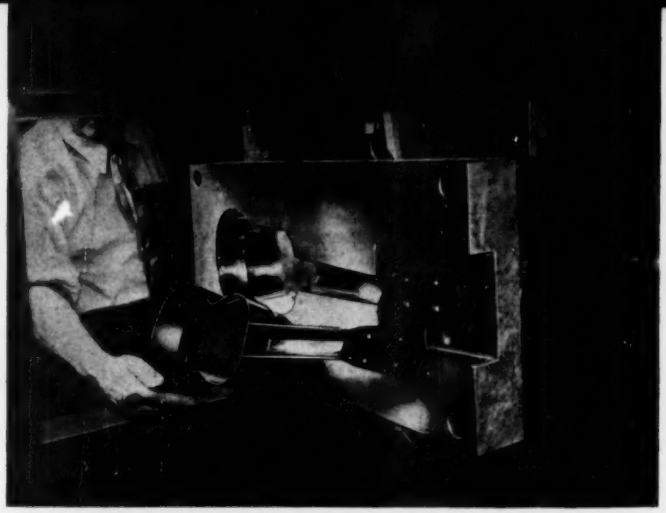
Wooden ukes range in price from $5 to $40. The polystyrene Islander, which is a standard size uke, retails for $5.95. The company states that the use of plastics for the strings and body of the instrument produces a perfect ukulele in true pitch and with a mellow, powerful tone.

In a regular wooden ukulele there are a total of 21 parts. The Islander has a sum total of eight plastic parts, excluding the four nylon strings and the four tuning pegs. These eight parts are the body, neck, and head (in one molded unit); the soundboard; the fingerboard, which has molded-in frets; the bridge; the soundboard ring; the head cover; the inside sound bar; and the nut. The small number of parts makes possible an assembly time one-fifth of that for a wooden uke. The body of the plastic uke is molded in simulated rosewood, with the head cover and soundboard in ivory.

One of the largest problems encountered during the pre-production days of the Islander was the selection of a material formulation that would have all the properties and characteristics necessary for the particular application. Four months were spent on the choice of a material—one that would withstand the tension of the strings, one that would not distort or shrink during the life of the instrument, and one that would produce the correct pitch, resonance, and tonal quality. The final polystyrene formulation chosen combined the above requirements with resistance to the effects of dryness, moisture, heat, or cold.

Another production problem that had to be solved was the proper selection of an adhesive. The wrong adhesive would result in either shrinkage of the polystyrene or a

(*Continued on p.* 208)



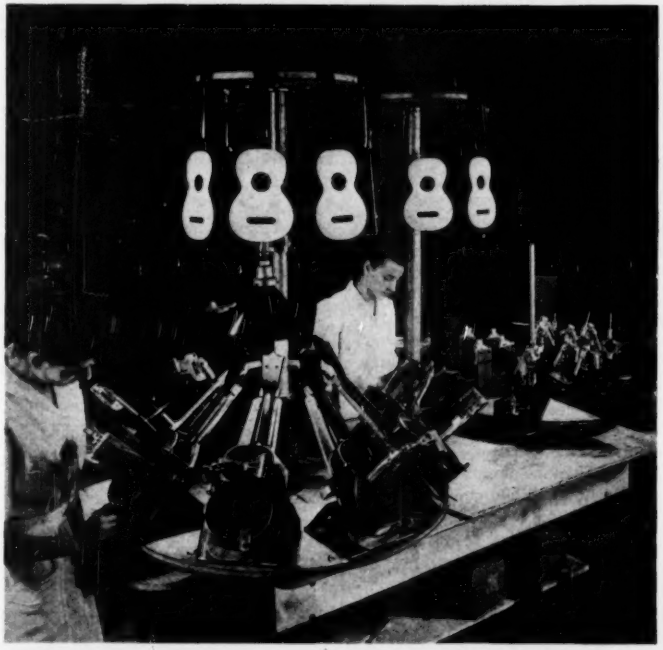
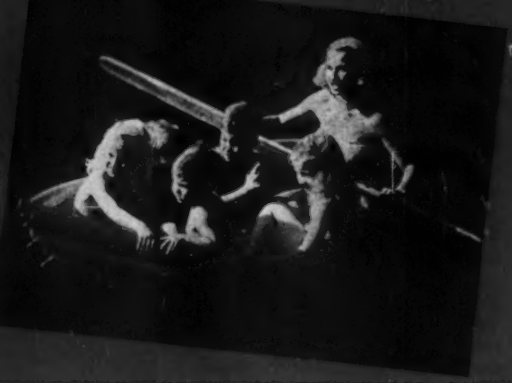


Photo at top, right: body, neck, and head (which is one molded unit) of the uke coming out of the mold. Middle photo shows the soundboards and bodies cemented together in special assembly jigs. At bottom are the nylon strings being assembled to the tuning pegs. The assembling adhesive used for the ukulele strengthens the various polystyrene parts against sound-deadening effects



Pioneering Pays Off

How development of methods for electronically sealing vinyl has taken the inflatable market away from rubber

WHEN a company can more than double its sales volume each year for three successive years, it must have something which is a better product and/or a better value. Such is the sales record of Bilnor Corp., Maspeth, N. Y., manufacturer of vinyl inflatables.

Bilnor's story began in 1945 when the company, after much experimenting, developed techniques for electronic bar-sealing Vinylite film. At that time, Bilnor could bar-seal up to 10 in. in one shot. Although the company can now seal up to 150 in., it considered 10 in. quite an accomplishment when this operation was begun five years ago.

Once the technique was developed, the question arose of how to exploit it commercially. The company's first item was a tobacco pouch. The electronically welded seams, it was felt, would make the pouch more air-tight and therefore better than those on the market. The company soon discovered that the market was limited, so production of the item was discontinued.

Then Bilnor decided that the best use for electronic seams was in inflatable items. The company's first such product was an inflatable pillow for use in hospitals or for travel use. An inflatable seat cushion and an inflatable mattress section were also produced about the same time.

Rubber Replaced

This was an invasion of a field formerly dominated by rubber. But there was a rubber shortage at the time and Bilnor's Vinylite inflatables did not have to worry about direct competition from rubber. This was fortunate because the plastics inflatables would have been unable to compete with rubber in price at that time.

At the end of 1946, Bilnor moved into the beach toy field with a 20-in. diameter swimming tube, beach balls, and swim wings. As it expanded its line, the company learned more and more about electronic sealing. It built its own bar-sealing equipment and devised methods of doing in one operation what it used to do in as many as eight or ten. It also learned how to eliminate the ragged edges which were characteristic of early sealing jobs.

As a result of these improvements in production methods, Bilnor brought down its costs. The swim

Vinyl wading pools are constructed of three independently inflated rings. Pools are available in 40-in. (right), 54-in., and 72-in. (left) diameters

ALL PHOTOS COURTESY BAKELITE DIV., UNION CARBIDE & CARBON CORP.

Inexpensive vinyl row boats have a wide variety of uses. They can be deflated and transported easily. Made in two sizes, they need no maintenance

tube, originally retailing for $3, was reduced to $1; the 20-in. beach ball became a $2 item instead of $5; the inflatable seat cushion was reduced from $3 to $1.

These improvements and the resultant price reductions came none too soon. Early in 1948, the rubber supply situation loosened up and the companies which had made rubber inflatables before the war came back into the business. Buyers welcomed their return and bought eagerly. They were betting that the public would prefer to have genuine rubber rather than plastic.

Public Preferred Vinyl

But even buyers can be wrong! The public continued to buy the vinyl inflatables and the rubber ones gathered dust on retailers shelves. The public preferred the plastic inflatables because their colors were brighter and more attractive; they were lighter in weight; by comparison with rubber, they were odorless. Furthermore, the rubber manufacturers tried to take up where they left off before the war and came out with the same old items. Bilnor and other vinyl

(*Continued on p.* 211)

How to Improve a Trowel

Butyrate handles replace wood plus metal ferrules and caps. The result: masons like them

WHEN W. Rose, Inc., Sharon Hill, Pa., redesigned its brick trowel handle in plastics, several important improvements were noted.

Bricklayers use trowel handles as hammers to set bricks; the new Tenite II cellulose acetate butyrate handle, molded by A. L. Hyde, Grenlock, N. J., is reported to outlast wood handles by as much as eight to one under this punishment.

Masons who are working near live wires like the protective insulation the plastic provides; the wood handles had metal ferrules and caps that could carry current. The plastic stands up perfectly to attack by sand, lime, and cement.

In the assembly of the trowel, several steps are saved by the use of the plastic handle. Formerly, the joint between the steel ferrule and the wood handle surface had to be ground; both the wood and the metal ferrule had to be polished and varnished; assembly involved handling three parts—wood handle, ferrule, and cap. In the new trowel, the tine is driven into the handle.

Priced 50 cents higher than the wood-handle trowel, the product has had good acceptance. Many bricklayers now want only plastic-handled trowels.

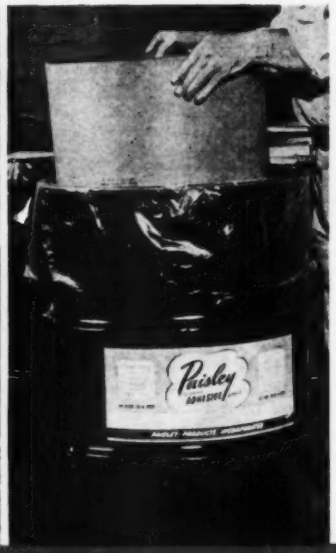
COURTESY TENNESSEE EASTMAN CORP.

Brick trowel handle of butyrate simplifies assembly. Tine is simply driven into the plastic

New Deal in

First step in placing polyethylene liner in drum when it is inserted by using a mandrel

In an alternate method, a metal disk is dropped into liner to form a bag



Mandrel is put into drum, then removed, leaving liner in position for filling

SPECTACULAR savings in bulk shipping costs—running as high as 70% in some instances—are reported through the adoption of polyethylene liners for steel and fiber drums and rectangular fiber containers. At the same time, product protection is greatly enhanced. A foremost exponent of this revolutionary packaging development is The Visking Corp. of Chicago, Ill., whose VisQueen polyethylene film tubing is fabricated into such liners by several converters.

Advantages of the liners include product protection, reduction in shipping charges because lighter weight containers may be used, and elimination of costly drum cleaning and reconditioning. Even with such "difficult" items as liquid adhesives or automotive undercoatings, product recovery is practically 100%, since the liners may be removed from the container and squeezed like a toothpaste tube until empty. Instead of requiring costly hand scraping and cleaning, steel drums can be kept in uninterrupted service and inventories reduced.

Putting Liners in Place

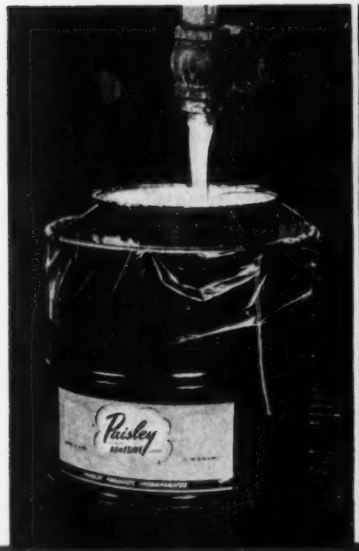
Liners are inserted with the aid of a mandrel or a metal disk, or settled into place as product is packed. After the filling operation, the top is twisted to exhaust extra air, tied, and allowed to untwist, leaving sufficient head space to prevent liner damage in transit. In an alternate closure method, the liner is folded down over the lip of the drum; then an octagonal sheet of polyethylene is placed over the top and the header cover sealed on.

The rapidly growing list of items being packaged in this manner includes foods, petroleum products, and chemicals. For dairy products such as liquid or frozen cream, ice cream mixes, or bulk cottage cheese, the high tensile strength, tear resistance and chemical inertness of the plastic film provide an ideal combination of properties. Among the many other products lending themselves to this streamlined packaging technique are meat items in brine, fresh frozen meats, animal sausage casings, bulk frozen fruits and vegetables, industrial lubricants, hydraulic fluids, and numerous chemicals—dry hygroscopics, corrosives, acids, alkalis, cyanide concentrates, etc.

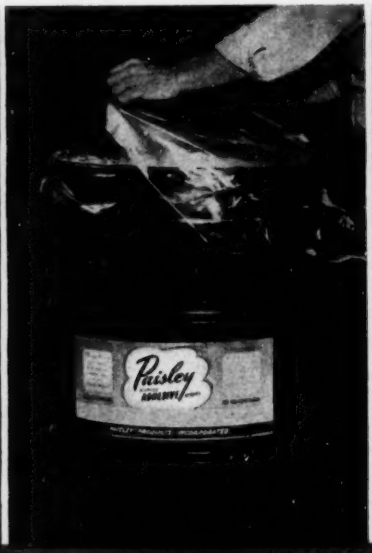
Shippers of heavy, viscous products such as automotive undercoatings report savings as high as 15% after adopting the polyethylene liners for steel drums. A shipper of frozen strawberries, who switched to a light-weight fiber container with liner, scored an average reduction in tare weight of 66%, with annual over-all savings exceeding $50,000. Increased sanitation and protection against flavor loss were additional advantages.

Drum Liners

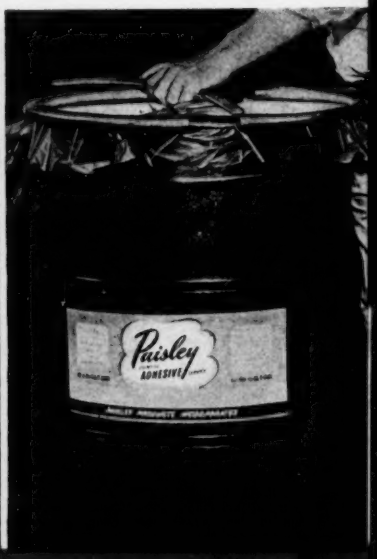
Polyethylene film, used to line steel or fiber drums, gives better product protection, reduces shipping costs, and eliminates drum cleaning



Product being poured into liner. Tube over edge of drum prevents air pocket formation



After filling, liner is folded over top edge of drum with a single-thickness sheet on top



In final step, header cover is sealed on drum. Liner permits almost 100% recovery

Shipping Costs Cut

A shipper of bulk meat products in brine, upon changing to fiber drums with polyethylene liners, achieved these savings on a typical shipment from Chicago to New York:

Rate: $1.96 per 100 lbs.

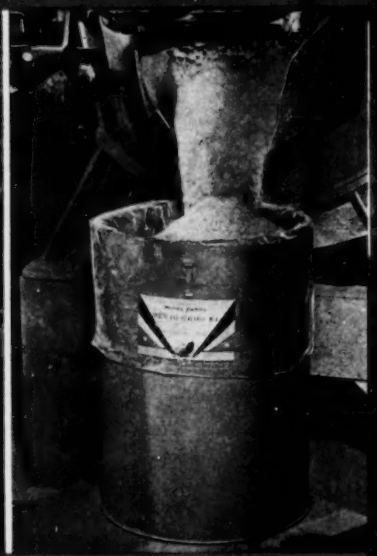
Quantity: 150 containers per car

Former container tare per car—7500 lbs., or $147

Polyethylene-lined fiber drums, tare per car—2100 lbs., or $41.46

Total saved per car: 5400 lbs., or $105.84

Use of polyethylene liner in shipping box for chocolate powder helps retain flavor



Chocolate beverage mix flowing into liner. After filling, liner is twisted and tied

First step in placing polyethylene liner in drum when it is inserted by using a mandrel

In an alternate method, a metal disk is dropped into liner to form a bag

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Emerson's

THE use of molded plastic cabinets for radios is closely allied with the trend, which began in the early '30's, toward "midgets" or "compacts." Emerson Radio & Phonograph Corp., New York, "the world's largest maker of small radios," pioneered in the development of the "compact" and also pioneered in the use of plastics.

In 1930, an Emerson model which was 17½ in. high and 16 in. wide was considered a "midget" and was advertised at the "sensationally low price" of $49.50. The first radio which would still be considered a

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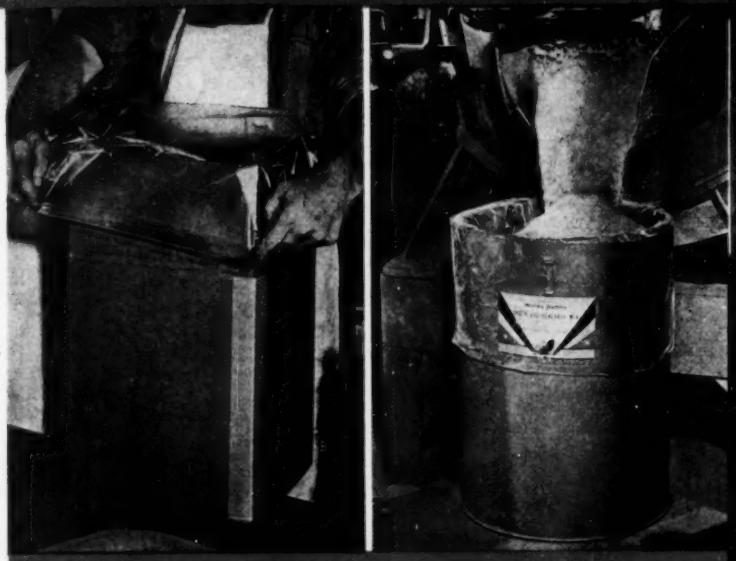

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Chocolate beverage mix flowing into liner. After filling, liner is twisted and tied

Plastics Story

First Emerson radio with a plastic cabinet was produced in 1933; today, four molding plants are needed to meet the demand

"compact" by modern standards was Emerson's Model 25, introduced in the 1932 line. It measured 10 by 6½ in., was housed in a wooden cabinet, and sold for $25.

First Plastic Cabinet

The following year Emerson introduced its first plastic cabinet, which was molded of Bakelite phenolic by Plastimold Corp. (then known as Associated Attleboro Manufacturers). The Model 20A, as it was called, had the same chassis as that used in the Model 25, but the plastic cabinet was so much more economical that the finished radio sold for only $17.95.

The plastic cabinet used on the Model 20A proved so satisfactory that Emerson used the same cabinet in its 1934 line for the Model 420, which was advertised as having "everything new but the bakelite cabinet."[1] This was an unusual step; when radio manufacturers bring out a new model, they usually go out of their way to make it look different. In fact, it is not unusual for "new models" to consist of nothing in the way of new features except the cabinet.

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Plastic Outsells Wood

Despite the success of the Model 20A and 420, and the lower prices made possible by plastic cabinets, Emerson continued to produce wooden cabinets and often offered

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1933

Dawega

★World's Largest Radio Dealers

Leads in Sales of

Emerson

"A Handful of Radio That Plays Anywhere"

World's Fastest Selling Radios

$17.95

Emerson Radios Operate On Both A/C a

$35

$30

DAVEGA CITY

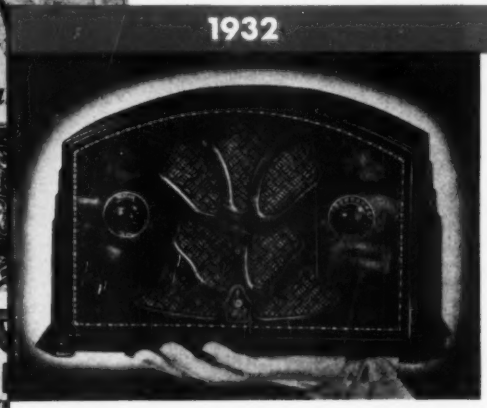
★ World's Larg

"A Handful of Radio That Plays Anywhere"

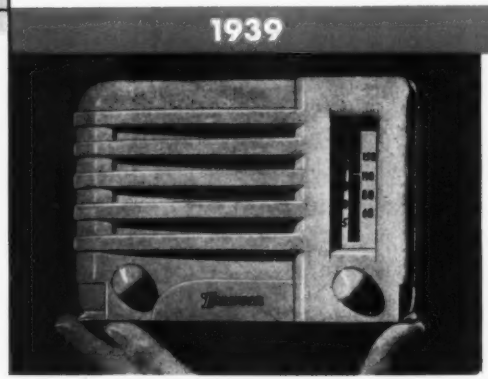
- The Office
- The Kitchen
- The Bedroom
- The Playroom
- The Guest Room
- The Automobile
- The Motorboat
- The Country
- While Traveling

ALL STORES OPEN EVENINGS

Newspaper promotion for Emerson's first plastic cabinet, Model 20A, which was molded of phenolic. The set's chassis was the same as in the earlier Model 25 (made of wood) which sold for $25; but production economies realized through the use of plastics made it possible to offer the Model 20A at the retail price of only $17.95


1932

First radio still to be considered "compact" by modern standards was Model 25 which was housed in wood


1939

Model 255, molded of walnut phenolic or urea in bright green, red, or ivory, featured unusual price of $6.95

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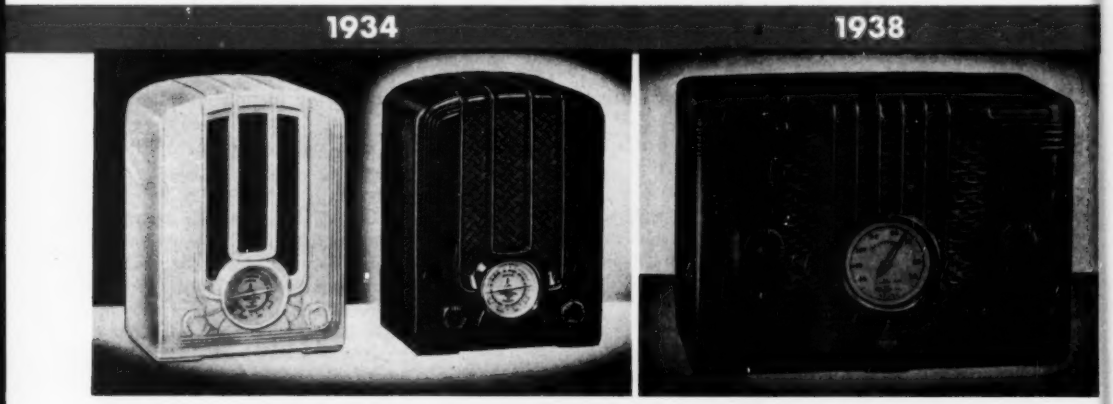
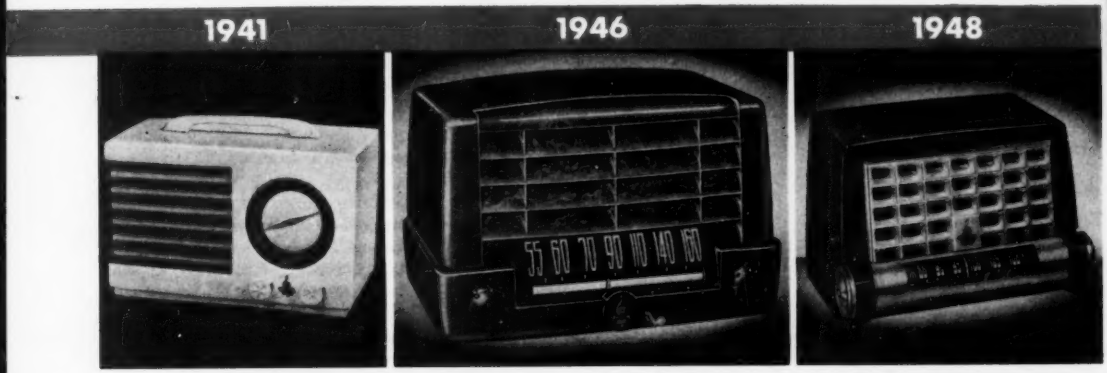


Emerson's first urea cabinet was on Model 108—sold for $5 less than same unit in wood. Set was also made in walnut or black phenolic

Production economies due to plastics brought about first set under $10: Model BA-199 housed in phenolic



Popular Patriot Model 400 had cast phenolic cabinet, butyrate grille

Emerson introduced its first polystyrene cabinet in Model 547 to launch the post-war line

Front panels of polystyrene sprayed from rear made debut in Model 602

the same chasis in either a wood or plastic cabinet. In such cases, the plastic model sold for about $5 less than the wood model—and consequently outsold the wood by about 5 to 1.

In the 1934 line, for example, Emerson's Model 110 had a wood cabinet and sold for $29.95. The same chassis was available in a plastic cabinet in the Model 108, which sold for $24.95. The cabinet for the 108 was molded of black or walnut phenolic or of ivory-colored urea. This was Emerson's first urea cabinet. Phenolic was also used for various subsequent Emerson models with ivory-colored urea as an alternative, sometimes at a slightly higher price.

The production economies possible with plastic cabinets helped bring the price of Emerson radios down. In the 1938 line, for example, the Model BA-199, housed in phenolic, was put on the market for $9.95. This was the first table radio ever offered to the public for under $10. The following year Emerson brought out the Model 255 with cabinet molded of walnut phenolic or of urea in bright green or red as well as ivory. The price of the set was an unheard-of $6.95.

In addition to the phenolic and urea cabinets, bright-colored cast phenolic cabinets began to enter the Emerson line in 1938. The Model AU-190, the first with a Catalin cabinet, was offered in either of two colors—"natural onyx or Brazilian onyx."

Enter the Thermoplastics

In the same year, the thermoplastics made their first appearance in Emerson cabinets in the form of grilles, knobs, and other accessory parts of cabinets made of other materials. These accessories were molded of either cellulose acetate or produced from cellulose acetate butyrate.

(*Continued on p. 212*)

Farewell to Fuse Boxes

Electrical circuit breakers, composed largely of phenolic parts, replace fuses in new and old wiring installations

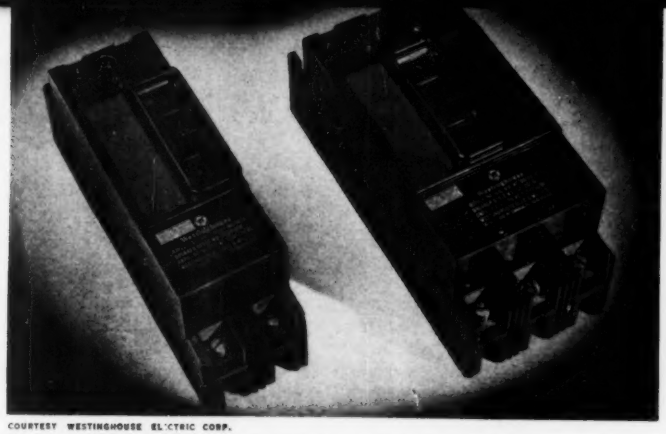
COURTESY WESTINGHOUSE ELECTRIC CORP.

Today's modern circuit breakers are composed largely of molded phenolic parts. Since the units are decorative, they may be placed anywhere in the house

THE old fashioned fuse boxes, a mystery to the average housewife, today are slowly but surely being replaced by plastic circuit breakers. The new breakers are sold to the ultimate consumer as components of a metal-cased household load center, containing multiple breaker units.

The circuit breakers, which are chiefly composed of phenolic parts, are automatic in operation. The breakers open when too much of a load is placed on the wiring. When a short-circuit occurs which causes one of the breakers to trip, service is restored simply by resetting the circuit breaker which has opened, thus eliminating the necessity of replacing a fuse or calling for a repairman.

Among the many companies now engaged in producing circuit breakers are Westinghouse Electric Corp. and I-T-E Circuit Breaker Co. Each I-T-E breaker contains 4 to 5 oz. of molded phenolic parts, which are made by Kuhn & Jacob Molding & Tool Co., Trenton, N. J. These parts cost in the neighborhood of 12 to 20 cents. This, it is reported, represents about 12% of the manu-



COURTESY WESTINGHOUSE ELECTRIC CORP.

The amount of molded phenolic material in the Westinghouse circuit breaker varies from 55 to 58% of total, depending upon size of breaker

facturing cost of the finished product. Other material costs, such as silver and copper, account for over 50% of the production cost. Today, I-T-E states that it is producing the circuit breakers at the rate of 200,000 per month.

The Westinghouse breakers, which are molded of Bakelite phenolic by Westinghouse, were first made with a cold-molded material. However, because of arc tracking across the material, the firm redesigned the breaker and switched to molded phenolic. The amount of phenolic used in the Westinghouse breaker varies from 55 to 58% of the total material, depending upon the size of the breaker. Westinghouse reports that the breaker has proved itself in more than 10 million installations.

It is reported by electrical companies that the average cost for servicing the new plastic circuit breakers is approximately 10% of that in systems where fuses are used.

Today, the circuit breakers are not only replacing the fuse boxes in existing buildings, but, to a large extent, are being applied in new construction.

Replacement of the old fuse boxes is quite simple and inexpensive. In new construction, load centers need not be relegated, for reasons of appearance, to the basement. Since they are decorative in design, they may be placed anywhere in the house.

Rubber Bows Out

Vinyl insulators for electrical test clips have long life, are superior to rubber

LAST year, the Mueller Electric Co., Cleveland, Ohio, manufacturer of battery and electrical test clips, decided to improve the quality and appearance of the rubber insulators used on the clips.

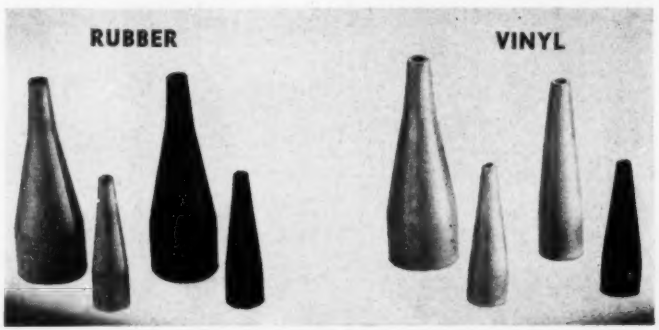
In its search for a new material, the company decided to experiment with elastomeric Vinylite. Accordingly, it ran a small test mold. The results proved to be so successful that Mueller Electric went into full-scale production on the plastic insulators and is now molding them in various sizes.

Costs Go Down

On the smaller size insulators, the company has been able to reduce its costs by 25 percent. However, as the size increases, the cost saving decreases, due to the basic cost of the raw material plus the fact that as the sizes get larger the number of cavities in the mold decreases, with resulting lower hourly production.

Today, the company is running six molds that have cavities ranging from six to 16, in cycles from about 16 to 42 seconds. Furthermore, it is reported that down time on the molds has been nil. Only one machine is used—a 6-oz. Lester injection-molding machine.

The reaction of the electrical industry to the vinyl insulators, it is stated, has been good. The high dielectric strength, long life, and resistance to oil and grease characteristics of the vinyl material have made the insulators a better product than they were in rubber.



Vinyl electrical test clips have proved better than old-type rubber ones due to high dielectric strength, long life, and high resistance to oil and grease

Television Cabinets Grow Larger

Economics of molding one-piece phenolic cabinets are reflected in low retail price of set

MAINTAINING its dominance in the field of large molded television cabinets, Admiral Corp., Chicago, has just unveiled a new consolette style set (Model 22X12) whose phenolic cabinet weighs approximately 42 pounds. This tops by some 7 lb. Admiral's earlier model[1] which was previously the largest plastic piece ever molded on a commercial basis in the U. S. market.

The new model stands 34 in. high, 18 in. wide, and 18¼ in. in depth, accommodating a 12½-in. picture tube. The modern-style cabinet features a speaker grille consisting of 30 square louvers and an integrally molded bezel which frames the picture screen and blocks out stray light rays. An integral inner shelf adds strength to the molding and provides simplified mounting for the chassis of the set. Like its predecessor, Admiral's new molded cabinet permits freedom of design while affording important production economies that are reflected in the final price tag. Thanks largely to the molded cabinet, Admiral is able to retail this set at $199.95, giving the customer a beautifully styled instrument with a housing which resists scratches, stains, and cigaret burns.

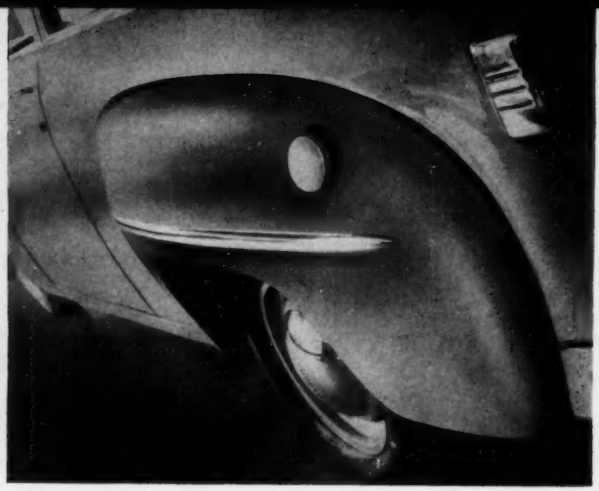
Molded Products Corp., Chicago, Ill., molds the cabinet in its new 2500-ton HPM press, utilizing "long-draw"-type general purpose phenolic material. At the time this issue went to press, detailed data on preheating time, molding cycle, etc., were still subject to modification and unavailable. The cabinet is now run as a single-cavity job, but production of two cabinets per cycle, using duplicate molds, is said to be a future possibility.

[1] MODERN PLASTICS 27, 153, (Jan. 1950), and 26, 74 (July 1949).

Television cabinet of phenolic has polystyrene knob panel and screen window, and butyrate control knobs. Model is 34 in. high, 18 in. wide, 18¼ in. deep

Other Plastics Used

Combined with the phenolic cabinet are a polystyrene knob panel and screen window and butyrate control knobs. The knob panel, of rectangular design, is molded of clear material, with markings filled with brown and the complete piece finished in gold from the back. It features a hinged door in the center concealing auxiliary "preference" controls. The brown butyrate control knobs have filled-in markings and decorative brass inserts which are pressed in place. The clear polystyrene screen window, or lens, an application pioneered by Admiral, simplifies assembly and reduces manufacturing cost by eliminating the separate mounting mask required with a plate glass screen lens. Amos Molded Plastics, Edinburg, Ind., molds the control knob escutcheon plate and lens for Admiral's new Model 22X12. The control knobs are by Santay Corp., Chicago, Ill.



ALL PHOTOS COURTESY CHRYSLER CORP.

Two typical installations of elastomeric vinyl fender welt. At the left is a colored welt in same color as car body, shown on a DeSoto. Welting resists influences of outdoor exposure. Fender welt on Plymouth at right is black

Chrysler's Vinyl Fender Welts

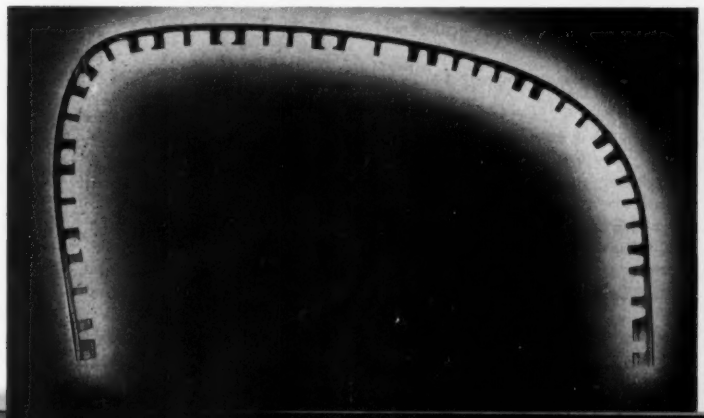
Four years of testing have proved the superior qualities of plastic for still another automotive application

ELASTOMERIC vinyl has replaced other materials for the fender welts of automobiles made by Chrysler Corp., because of its superior weathering qualities, flexibility, color possibilities, and resistances to solvents, cleaners, and waxes. Previously, fender welts were made of asphalt-impregnated paper or burlap, reclaimed rubber-impregnated paper or burlap, or rubber-coated glass cloth.

Vinyl welts were tested for almost four years in the laboratories of Chrysler's Engineering Div. and road-tested on cars before they were finally accepted for use on production models.

The cut-out design of the production welt used reduces the weight of the welt, imparts the necessary flexibility needed for assembly, and allows openings for the Chrysler bolted-on fender. A service replacement welt has a universal cut-out design similar to the teeth of a comb. The "teeth" can be be cut off where necessary to allow for fender bolts. Each car uses two welts and each welt weighs between 0.35 and 0.40 pounds. Black vinyl welts are used on some models. In others, the color possibilities of vinyl have been utilized to produce a welting which matches the body color of the car. The colored welting resists the influences of outdoor exposure as well as the synthetic enamel coat of the car.

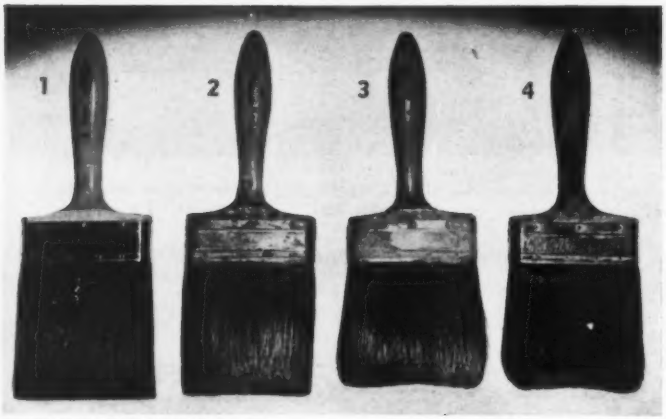
Typical production fender welt laid out as installed. Cut-out design reduces weight of the welt. Service replacement has universal cut-out design similar to comb teeth



Typical fender welt cross section slightly larger than actual size

In Brushes, Life Cost Counts

Nylon paint-brush bristles, superior to hog bristles in wearing qualities, are invading the huge consumer market



COURTESY RUBICO BRUSH MANUFACTURERS, INC.

How nylon bristles stand up: Brush No. 1 is new, unused; No. 2 has been worked over 40,000 sq. ft.; No. 3, over 75,000 sq. ft.; and No. 4 over 125,000 sq. ft.

IN the spring of 1950, E. I. du Pont de Nemours & Co., Inc., will launch a big new consumer campaign to emphasize the advantages of nylon paint brushes. This campaign may well serve to end the brush manufacturer's dependence on imported hog bristles and to open a clear road for nylon.

Although master painters have been using paint brushes with nylon bristles for some time, Du Pont's new aim is to open the consumer market, which it estimates at over 40 million brushes annually.

The company has been working on nylon bristles ever since 1937. During the war years, when bristle imports from China were cut off, Du Pont produced millions of nylon blunt-end bristles for the Navy.

After the war, the brush manufacturers turned the brushes loose on the commercial market. Their initial acceptance by master painters was poor because the brushes left bad brushmarks. Today, however, that one problem has been licked by paint brush manufacturers: the ends of the bristles are sanded to a fine taper.

Du Pont is making four claims for its nylon bristles: They paint smoother, they are easier to clean, they are extremely durable (it has been proved that the life of a nylon bristle is approximately five times that of a hog bristle), and they are ideal for all finishes, except shellac and creosotes which have not had coal tar acids removed. Although it was first thought that the nylon-bristled brushes would be more expensive than hog-bristled brushes, the situation is such that nylon and hog bristles are now down to approximately the same consumer price level. This makes the nylon brushes far more economical because of their greater longevity.

Du Pont feels that there are several factors regarding the nylon bristles that will have a potent

(*Continued on p.* 215)

The Proof Is in the Washing

Phenolic washing machine agitators, made for over 20 years, have recognized superior features

IMPROVED materials, design and molding techniques have all played a part in bringing phenolic washing machine agitators to their present position of dominance.[1] It is interesting to note, however, that their superior features were recognized by some manufacturers more than 20 years ago, and that at least one agitator mold originally placed in service as far back as 1941 is still in daily production.

When Meadows Mfg. Co. pioneered and patented plastic agitators in 1927, the company ran newspaper ads highlighting the virtues of its Bakelite six-vane impeller, which was produced by Chicago Molded Products Corp., Chicago, Ill. Tests were cited which showed that the plastic impeller washed clothes cleaner, in less time, than a machine with metal agitator, with

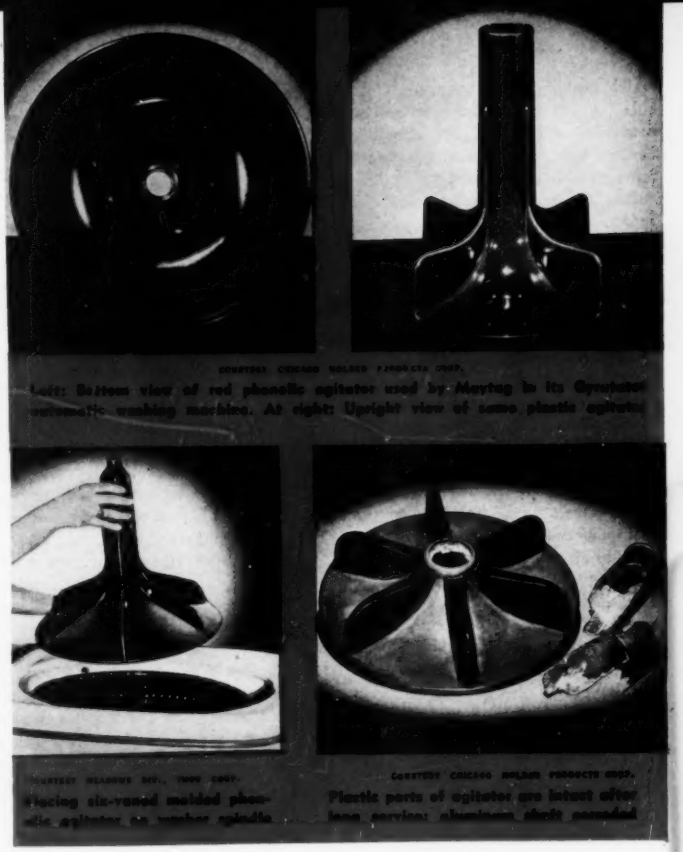
[1] See MODERN PLASTICS, 27, 183 (Jan. 1950).

only about one-sixth the wear on the clothes. Chicago Molded now produces agitators for the latest wringer-type washers made by the Meadows Div., Thor Corp., Chicago, Ill., as well as for the new Thor Automagic machine.

Suds Resistance

Even the early phenolic agitators demonstrated their superior resistance to the action of washday suds. An accompanying photograph shows a Meadows agitator of later design in which phenolic vanes were combined with an aluminum shaft. After years of service, the metal was literally eaten away, but all the plastic components had remained intact.

The Maytag Co., Newton, Iowa, which recently turned out its six millionth washing machine, began to use plastic agitators shortly after Bakelite Corp. announced and demonstrated its improved agitator material. The original mold built and run for Maytag by Chicago Molded is still in production, turning out Gyratators of the conventional type. The company is also a co-supplier of the specially designed agitators for the new Maytag automatic washer.

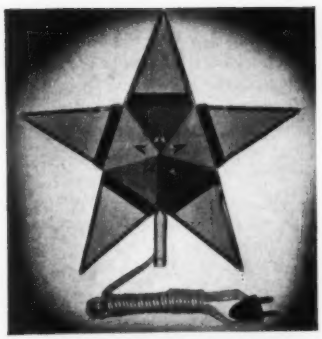


Left: Bottom view of red phenolic agitator used by Maytag in its Gyratator automatic washing machine. At right: Upright view of same plastic agitator

Plastic parts of agitator are intact after long service; aluminum shaft corroded

Plastics for Christmas

Acetate and polystyrene replace glass and plaster in Christmas ornaments; sales climb 30 percent



Polystyrene star, illuminated from center, has high resistance to heat

THE basic business of Noma Electric Corp. is the production and merchandising of illuminated Christmas decorations. The basic philosophy of Noma in this business is the production of more durable decorations, more unusual decorations, and safer decorations. It is natural, therefore, that Noma uses colossal quantities of plastics in its Holyoke, Mass., and other plants.

Breakage, Safety Factors

The element of durability in these products and components, from Noma's standpoint, is quite as important in the distribution stage between factory and consumer as it is after the decorations get on a tree in a home. Breakage in stock and assembly and breakage in retail display would result in heavy returns of merchandise. There is, also, a safety factor involved here because broken glass (from which a lot of Christmas tree ornaments used to be made) is not safe to handle. Another phase of the safety element is flame resistance which becomes effective only after the decorations are in the customer's hands.

One of Noma's newer lines, introduced for the 1949 Christmas season, is a set of seven fancy figures

which, snapped on over the light bulbs, glow cheerfully. A rabbit, a snowman, a canary, an angel, a Santa Claus, a pup, and a cat are represented. These used to be imported from Czechoslovakia and Japan, made from glass. The glass was necessarily thin; so the ornaments broke all over the place. Now, Noma makes these products out of Hercules flame-resistant acetate at approximately twice the cost of the glass product—but with three times the satisfaction to retailers and consumers and one-third the grief in distribution. The plastic products were designed for proper ventilation and are fairly cool to the touch after hours of illumination. Naturally, they sell much better than did their glass counterparts.

Another Noma product which enjoys great popularity is a plastic star, illuminated from the center, the light passing out through five triangular prisms, clipped to a pentagonal center piece. These triangular points also used to be made of glass. When the switch was made to high heat-resistant polystyrene, there was found to be much less breakage in plant, far fewer returns from retailers on account of fracture, and an actual saving in cost of 1½ cents per star.

Fancy figure set of flame-resistant acetate offers less breakage

Cellulose acetate altar is stronger than plaster and glass predecessor

The famous Noma altar, quite a large item which used to be made of plaster of paris with glass candles, is another item which has been converted to plastics. Now made of Tenite I cellulose acetate, the product has 10 times the durability of its plaster and glass predecessor and, though costing at least twice as much, has a decidedly enhanced sale because the customers realize that they are getting their money's worth in the plastic altar.

In general, Noma does not directly switch from other materials to plastics in Christmas tree decorations, preferring to completely redesign or to create new products specially adaptable to the use of plastics. By using plastics, the company has registered a 30% increase in sales in the items discussed above.

Wisdom in Wiring Devices

Surface wiring devices made of phenolic and urea are arc-resistant, light in weight, small and neat in appearance

ARC-resisting surface wiring devices made of plastics and approved for use in basements, attics, garages, barns—in fact, on any surface-wiring job—today are replacing similar devices made with traditionally used ceramic materials.

Plastics have been so successful in this market because they are lighter, resist cracking or chipping, and because they make possible small, neat units. Furthermore, because of the arc-resisting quality of the plastics materials used, the devices can be employed under moist and corrosive conditions.

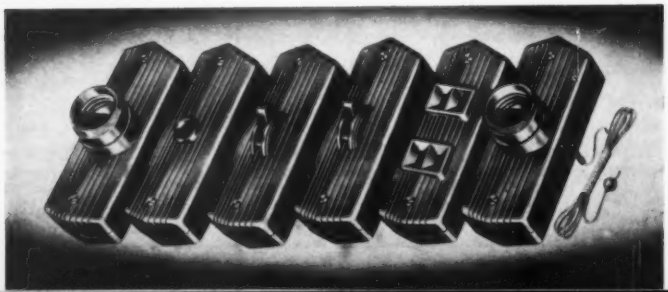
Among the companies manufacturing such electrical devices is Monowatt, Inc., Providence, R. I. Monowatt molds the bases of its surface-wiring devices of Beetle urea and the tops from Bakelite and Durez phenolic.

Although Monowatt has had manufacturing experience only with plastics, it has handled distribution of ceramic devices and finds that from the point of view of packing, handling, and shipping, plastics are far superior and more economical. Shipping costs on the ceramic devices are three times as high as those made of plastics.

The plastics wiring devices take either non-metallic or armored cable and are made in single-pole and three-way switches, keyless and pull chain lampholders, double outlet and junction boxes, or rosettes. The switches, which are U/L approved, meet federal specifications.

Wiring devices, with urea bases and phenolic tops, are replacing similar devices made of ceramics. Plastics have been successful due to their high arc-resistance

COURTESY MONOWATT, INC.



POLYESTER REPORTER

NEW PROMOTER INCREASES HANDLING EASE OF LIQUID POLYESTERS IN VERTICAL LAY-UPS

The handling advantages of liquid polyesters can now be more easily utilized in such vertical lay-ups as boat hulls, rectangular box constructions, and others without drainage problems. This new technique requires no pre-warming and cooling step as with the waxy type resins nor close tolerances on the lay-up time as with trigger-promoted systems. It is based on the discovery of a promoter whose action gives quick gelation but does not trigger the catalyst, so that plying up and curing of one or more layers may be delayed for eight hours or more. A typical formulation and procedure is as follows:

❶ FORMULA:

VIBRIN 112	100 parts
Benzoyl peroxide	1.5 parts
Styrene	0.8 parts
Promoter #4	2.2 parts

❷ MIXING PROCEDURE:

Weigh out the benzoyl peroxide and add the styrene to it (a dropper may be used for convenience on small amounts of liquids but should be calibrated first). Allow to stand for five minutes, then weigh in the VIBRIN and stir to clarity. Avoid stirring in air. Add the Promoter #4 and mix thoroughly for one minute; again avoid whipping in air.

❸ MAT HANDLING PROCEDURE:

Place a layer of cellophane on flat working area and then place mat or fabric on this. Now pour the mixture prepared in "2" uniformly over the mat, cover with cellophane and roll or squeeze lightly to distribute resin uniformly. Gelation will now occur in several minutes, depending on the working temperature of the materials used (all of which should be kept at same temperature for most uniform results). As a guide, the following temperatures should hold approximately:

100° F.	initial gelation in 4 minutes
90° F.	" " 6 "
80° F.	" " 7 "
70° F.	" " 9 "

No temperatures below 70° F. are recommended, as firm gelation is not always obtained.

❹ BUILDING PROCEDURE:

When the mat has gelled as in "3" it can be used immediately but it is preferable to wait another fifteen minutes, when it will be somewhat firmer, and will then remain in a usable condition at normal temperatures for at least eight hours. Some pressure (30 psi or more) is necessary to get good contact between plies in a laminar construction and heat is applied in the usual manner to initiate and obtain a final cure.

NEW METHODS—NEW MATERIALS AVAILABLE TO YOU

The promoter described above is typical of the improved methods and materials which we are constantly developing in our laboratories. Many are produced in solving specific problems our users give us . . . saving time and cost, creating new ingredients for specialized needs. In addition, 7 standard VIBRIN types are now available, among them self-extinguishing and water white. *Remember, there's always a Naugatuck technician ready to solve your problems.*

Naugatuck Chemical

DIVISION OF UNITED STATES RUBBER COMPANY

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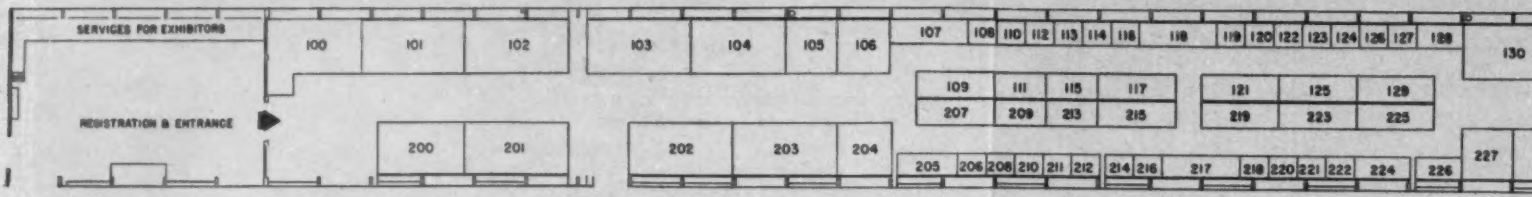
Floor Plan and List of Exhibitors at 4th National



Ace Abrasive Laboratories, Inc.
Booths 236. Exhibit: Stardust diamond abrasive products, including laboratory graded diamond lapping compounds and diamond powders.
Representatives: Benjamin Greenfield, Fergus Magee, Charles Trebulus, H. B. Collins, Jr., John T. Kelly.

American Cyanamid Co.
Booth 231. Exhibit: Boats, mannequins, tote boxes, trays, fishing rods, industrial and decorative laminates, and decorative corrugated sheets made of Laminac resin; dinnerware, and industrial parts molded of Melmac; housings, buttons, closures, wiring devices, and hardware applications of Beetle molding compounds; decorative and industrial laminates made with Melmac laminating resins.
Representatives: William MacHale, A. T. Steele, John Shannon, Bob Hiller, Bill Chancellor, Henry Dutot, T. M. Wennergren.

American Molding Powder & Chemical Corp., and A. Bamberger Corp.
Booth 147. Exhibit: Ampacet molding powders and products made therefrom; mother-of-pearl and other special effects created in Ampacet polystyrene; plastics scrap reprocessing services offered by A. Bamberger Corp.
Representatives: A. Bamberger, Gerald F. Bamberger, Herbert H. Goldmark, Justin Zenner.

American Steel Foundries, Elmes Engineering Div.
Booth 200. Exhibit: 200-ton, semi-automatic compression molding press in operation; push button controlled 50-ton Hydrolair press; 30-ton Hydrolair press; 30-ton laboratory press.
Representatives: Charles F. Elmes, Joseph W. Tomka, John E. Bush, John N. Hester.

American Wheelabrator & Equipment Corp.
Booth 170. Exhibit: A 20 by 27 in. (2 cu. ft. capacity) Wheelabrator Tumblast and Dustube Dust Collectors in operation removing flash and fins from molded plastic parts.
Representatives: S. S. Deputy, A. E. Lenhard, J. E. Skene, L. J. Wieschhaus, R. M. Rick.

Amos Molded Plastics
Booth 202B. Exhibit: Large injection molded parts ranging from 16 to 45 ounces, including many refrigeration and television parts; plastic packages, both plain and highly engraved.
Representatives: Dale Amos, J. C. Kazimier, H. L. Conover, Frank D. Deli, Fred A. Cole, Palmer Skoglund.

Associated Plastic Companies, Inc.
Booth 156. Exhibit: Custom molded refrigerator crisper doors, freezer doors, pans, breaker frames; containers; tumblers; flower pots; flexible ice cube trays; wire and cable support clamps; saran pipe, tubing, and fittings; textile sheaves and idlers.
Representatives: Otto Swartz, P. J. McCrory, C. Verne Dewey, H. W. Perkins.

Avery Adhesive Label Corp.
Booth 264. Exhibit: Kum-Kleen labels, including informative labels for the plastics industry; the Kum-Kleen electric label dispenser.
Representatives: H. R. Smith, C. J. Lee, H. V. McKinley, Martin Bender, John S. Torrey.

Bakelite Div., Union Carbide & Carbon Corp.
Booth 103. Exhibit: Bakelite and Vinylite plastics in newly developed applications; phenolic molding materials, polystyrene molding materials, laminating and adhesive materials, bonding materials, coating materials, vinyl extrusion and molding materials, vinyl calendering materials, vinyl sheet and foil, vinyl film and sheeting, and vinyl wire and cable materials.

The Baldwin Locomotive Works
Booth 229. Exhibit: Baldwin-Defiance preform press, and other press equipment.
Representatives: R. G. Tabors, B. B. Belden, J. J. Littley, W. C. Kriebel.

Ballard Advertising Novelties
Booth 257. Exhibit: Ink printing on plastic advertising specialties.
Representatives: J. M. Ballard, Mrs. J. M. Ballard.

Bee Chemical Co.
Booth 222. Exhibit: Current applications of clear, transparent colored, pigmented, and metallic Logoquants on plastic.
Representatives: M. A. Self, Walter H. Meyer, John Scharnberg.

The Borden Co., Chemical Div.
Booth 224. Exhibit: Products made with Durite molding compounds and industrial resins; glued wood products.
Representatives: S. Gurley, B. B. Wadsworth, E. A. Johnson, W. W. Johnson, R. N. Boucher, H. Sanders, C. R. Olson, L. Jaworski, R. Bandekow, T. J. Dee.

Borkland Laboratories
Booth 235. Exhibit: Products made under Borkland Processes, including Print-Mold.
Representatives: G. Walter Borkland, William D. Caddell.

Brown Co.
Booth 143.

Celanese Corp. of America.
Booth 232. Exhibit: Applications of Lumarith cellulose acetate plastic in toys, toilet seats, etc.; extruded acetate sheeting and applications of this new material; Forticel and its application in the fountain pen industry.
Representatives: W. S. Landes, L. Eckler, E. W. Ward, W. M. Porter, D. S. Hopping, E. H. Miller, J. J. Keville, J. T. Growley, S. W. Murray, E. W. Smith, J. W. Flynn, W. K. Woodruff, K. W. Kithil, R. B. Carter, H. B. Leinbach, P. J. Dunn, H. O. Hill, T. F. Tibbett, G. Roxborough, Miss Harriet Raymond.

Cellucraft Mfg. Co., Inc.
Booth 157. Exhibit: Acrylic pearl with intaglio effects; shirt accessories and other fabricated plastic items.
Representative: Morton Lefkowitz.

Center Tool & Mfg. Co.
Booth 240.

Central Die Casting & Mfg. Co.
Booth 237. Exhibit: samples of injection molded plastics and die castings of zinc and aluminum.
Representatives: L. J. Sebek, L. J. Tunik, P. Young, H. S. Kleifgen, T. Ball, F. Friedlieb, R. H. Campbell, F. Campbell.

Central States Steel Boiler Co.
Booth 161.

Chicago Molded Products Corp.
Booth 242. Exhibit: Compression, transfer, and injection molded parts produced for the automotive, electronic, radio, television, household appliance, and housewares industries; transparent working model of the Sunbeam Model W Shavemaster which employs 17 plastics parts.
Representatives: E. F. Bachner, J. J. Bachner, J. E. Johnston, L. F. Smith, E. M. Quinn, F. C. Raymond, P. J. Bachner, R. E. Reynolds, C. S. Fegley, B. A. Attig.

Cleworth Publishing Co., Inc.
Booth 208, Exhibit: *Plastics World*, *Plastics News Letter*, and books on plastics by various publishers.
Representatives: C. Wm. Cleworth, Geo. W. Rhine, W. B. Cowilich, W. Paul Pincher, Dudley B. Trott, G. H. Gannett, Jr.

Conforming Matrix Corp.
Booth 259. Exhibit: Masking shields for spray painting decoration; air operated masking fixtures; air operated automatic spray painting machine in which innumerable small parts can be decorated.
Representatives: A. J. Speiker, Hamilton E. MacArthur, Mrs. Ella May MacArthur, Robert B. Way, Milton Schimmel, Carl Hersey.

Creative Plastics Corp.
Booth 249. Exhibit: Plastallions, molded transparent plastic pieces in which are embedded various other objects.
Representatives: Arthur DeAngelis, Todd Harris.

Crown Machine & Tool Co.
Booth 251. Exhibit: Six-ounce injection molding press.
Representatives: William M. Harrison, James Harrison, William G. Whitehouse.

Cruver Mfg. Co.
Booth 118. Exhibit: Refrigerator, automotive, radio, and television parts; molded pieces made on large capacity injection molding presses.
Representatives: C. L. Cruver, Jr., J. H. DeSobe, E. F. Bristol, J. R. Byrne, H. Pergande, F. J. Hoope.

Distillation Products Industries Div., Eastman Kodak Co.
Booths 220, 221. Exhibit: Molded plastic items and plastic sheet coated with metal with high vacuum evaporation process.
Representatives: Frank M. Jenner, A. H. Hartman, Tom C. Comer, Wm. F. Dolke, Carl W. Herrmann, Everett M. Brown, G. H. Bancroft.

The Dow Chemical Co.
Booth 101. Exhibit: Styron for housewares, toys, miscellaneous rigid containers, and premium items; saran fabric and insect screening; saran film for food wrap.
Representatives: D. L. Gibb, W. R. Dixon, C. F. Cummins, D. B. Morse, R. L. Curtis, A. L. Ruddock, E. R. Haines, P. M. Jensen, Max Christensen, R. E. Daniels, J. W. French, J. C. Tobin.

E. I. du Pont de Nemours & Co., Inc.
Booths 121, 125, 219, 223. Exhibit: Nylon, polythene, and Teflon tetrafluoroethylene resins; Rulan flame-resistant wire coating material; Lucite acrylic resin; nylon filaments; Plastacele cellulose acetate; Pyralin cellulose nitrate; Butacite polyvinyl acetal resin; various applications of these materials.
Representatives: L. B. Gillie, P. W. Crane, E. J. Pechin, E. B. Yelton, S. P. Miller, J. W. Shackleton, E. H. Tyson, M. M. Taylor, W. J. Ambersley, D. G. Fertman, R. T. Zintl, R. T. Teetsel, F. H. Berdan, W. S. Black, F. E. Collins, C. P. Fortner, W. Halliwell, Jr., A. A. Hankin, R. A. Hoffer, O. C. Johnson, Jr., E. A. Kibler, G. M. Kuettel, J. M. Mack, D. B. Hanson, C. F. Newman, Jr., K. J. Persak, H. A. Rosley, M. L. Shaw, Jr., M. L. Shaw, Sr., J. O. Ullman, C. M. Waugh, W. J. Woods.

Durez Plastics & Chemicals, Inc.
Booths 122, 123, 124, 126, 127. Exhibit: Examples of products which have converted to plastics; typical parts molded of Durez materials; uses of Durez industrial and protective coating resins.
Representatives: A. W. Hanmer, Jr., R. E. Dodd, J. F. Snyder, W. A. Fuller, H. S. Spencer, E. E. Woodman, F. C. Rowley, G. A. Schroyer, J. S. Miller, H. B. Puff, R. J. Roach, E. F. Borro, C. R. Simmons, J. C. Cassidy, Jr., J. F. Morton, J. W. Ferguson.

Electric Mfg. Co., Inc.
Booth 241. Exhibit: Typewriters, calculators, and adding machines with two-color molded keys; other two-color products.
Representatives: E. L. Danielson, F. H. Walters, M. Hill, K. Gossett, H. Camph.

Engis Equipment Co.
Booth 135. Exhibit: Hyprez Diamond compounds and accessories as they apply to the finishing of molds and dies; tools, accessories, and methods recommended for rapid and economical mold finish and surfacing.

Erie Resistor Corp.
Booth 212. Exhibit: Three-dimensional parts for automotive, radio, and appliance industries; television windows; refrigeration parts.
Representatives: W. C. Canroy, S. W. Duncan, J. Kilfoil, D. Washabaugh, W. Neelon, W. Patterson, W. H. Fryling.

Farley & Loetscher Mfg. Co., Plastics Div.
Booth 247. Exhibit: Farlite dinette tops and restaurant counters; desk surfaced with genuine veneer Fariwood sheets; compreg propeller blade, picker stick, engraving stock, and name plates.
Representatives: Fred R. Loetscher, C. E. Walz, Lee M. Rogers.

Federal Tool Corp.
Booth 246. Exhibit: Beryllium copper pressure castings.
Representatives: Lyman L. Bennett, Ray J. Olson, John E. Press.

The Fellows Gear Shaper Co.
Booth 258. Exhibit: Fellows machinery and samples of work done with that machinery.
Representatives: J. G. Whitman, R. W. Lepanen, Dudley Flint, F. C. Means, J. Hronek, Fred Zumstein.

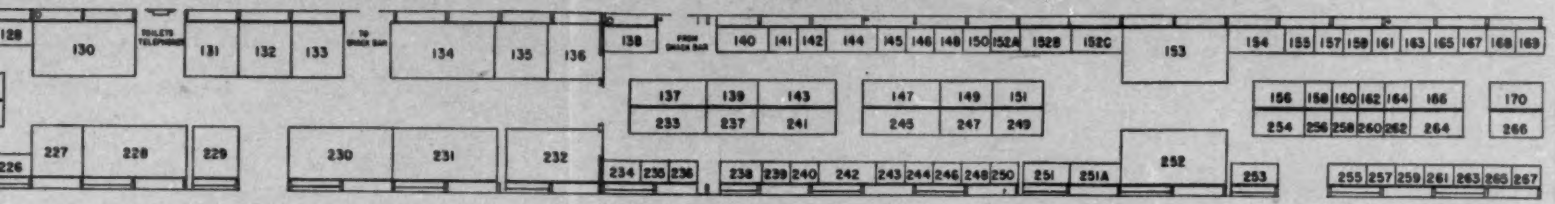
Ferro Chemical Corp.
Booth 135. Exhibit: Stabilizers for use in polyvinyl chloride resins; finished vinyl articles illustrative of the various effects of several stabilizers.
Representatives: David L. Cable, Stanley B. Elliott, A. G. Lilla, R. E. Lally, Ray J. O'Hara.

Fiberite Corp.
Booth 230.

Flexion Corp.
Booth 110. Exhibit: Vinyl film, plain and printed, in four gage to 20 gage.
Representatives: A. H. Weiswasser, Fred Weiswasser, Steve Wise.

General American Transportation Corp., Plastics Div.
Booth 136. Exhibit: Television cabinet, radio-phonograph

onal Plastics Exposition in Chicago, March 27 to 31



cabinet, scale housing, agitators, tableware, tackle box, and other compression molded parts; refrigerator parts, Nash dash panels, sign, packages, and other injection molded parts.

Representatives: A. N. Williams, George Moseley, R. B. Silverman, Harry M. Jenkins, James Nash, Ned Porte, John Iacurto, Marvin Jones, Charles Grim, Ray Kessenich.

General Electric Co., Chemical Dept.

Booth 228. Exhibit: Plastic surfacing material; new industrial punching grade laminate; plastics molding compounds, including Hycar and fast curing compounds; silicone glass laminates; silicone glass molding powders; silicone rubber; silicone mold release agents; laminating varnishes; plasticizers; plastic surfacing materials for school black boards; low pressure laminated cover for outboard motors.

Representatives: R. G. Steinkamp, J. R. Stirrat, J. W. Raynolds, T. L. Giblin, R. Poet, A. Slootmaker, E. Koehler, R. G. Boulter, B. F. Tollefson, A. T. Wolcott, E. W. Winslow.

General Plastics Corp.

Booth 158. Exhibit: Continuously extruded acetate and butyrate thermoplastic sheeting; examples of form drawing and fabricating of thermoplastic sheet materials; signs, displays, and other applications of molded sheet materials.

Representatives: Richard H. Eriewine, Charles W. Richter, Dale D. Boxell.

Gits Molding Corp.

Booth 150. Exhibit: Three-dimensional Crystal Seal name plates, automobile buttons, dials, escutcheons, plaques; double shot molded products such as dials, decorative plaques, counting wheels, typewriter keys; various proprietary and custom molded products.

Representatives: J. P. Gits, J. A. Gits, J. A. Gits, Jr., C. N. Cahill, Robert Gits, R. B. Byrne, J. C. Gits, J. Megacz, Robert Daniels, L. Aggerbeck, J. C. McCarthy, Howard Engleaby, Robert Davis, F. Baldwin, A. J. Haske, Sam Mitchell, Arthur Preglow, Ralph Schraufnagel.

B. F. Goodrich Chemical Co.

Booth 130. Exhibit. An improved, easy processing straight polyvinyl chloride resin; vinyl resin especially designed for rigid applications; solution resin designed for low cost solvents with excellent water and chemical resistance; dioctyl phthalate plasticizer; dioctyl adipate plasticizer; waterborne resins designed for industrial and packaging applications; plastic compounds in cubical form; demonstration of the easy moldability of Geon plastics.

Representatives; J. R. Hoover, G. A. Fowles, W. D. Parrish, O. E. Isenburg, G. E. Field, R. C. Bascom, G. W. Flanagan, M. W. Osborne, J. F. Moriarty, W. D. Lahey, J. S. Wolff, A. E. Grissom, J. S. Detwiler, H. M. Zimmerman, H. E. Andersen, R. C. McPeak.

The Goodyear Tire & Rubber Co., Inc.

Booth 233. Exhibit: Pliovic vinyl chloride copolymer resins; various items which have been produced from Pliovic resins by calendering extrusion, etc.

Representatives: H. R. Thies, W. H. Aiken, R. S. Earhart, W. C. Kirschner, A. E. Polson, J. M. Hussey, D. E. Neese, J. W. Bear, E. J. Hill, C. O. McNeer, R. T. Hickcox, J. A. Weatherford, R. E. Workman, H. R. Erwin, J. R. Guilliams, W. E. Kelly, J. E. Warner, W. H. Abernethy

The Grigolait Co.

Booth 111. Exhibit: Molded plastic parts with complicated or involved designs; plastics as presently used in combination with metal stampings by the major appliance industry.

Representatives: E. L. Shepherd, Fred W. Sobottka, R. H. Campbell, Frank Campbell, Ted Ball, Fred Friedlieb.

Hercules Powder Co.

Booth 109. Exhibit: Hercules self-extinguishing flame-resistant acetate and products made of that material.

Representatives: J. J. B. Fulenwider, E. G. Crum, J. M. Martin, C. W. Eurenius, J. B. Martin, E. E. Hixon, R. Hanna, A. R. Olsen, G. B. Bossert, P. A. Belk, T. Marvin.

E. F. Houghton & Co.

Booth 238. Exhibit: Hydraulic oils for plastic molding machines; high temperature oils; general lubricants; packings for hydraulic application.

Representatives: Frank Ross, A. A. Miller, C. R. Schmitt, H. C. Frisbie, J. J. Samter, D. C. Miner.

Hy-Sil Mfg. Co.

Booth 141. Exhibit: Metalized plastic sheeting.

Representatives: Lester E Fields, Richard Silverman.

Imperial Molded Products Corp.

Booth 138. Exhibit: Samples of difficult precision molding; small electric press operating on a compression part.

Representatives: L. H. Amrine, R. S. Amrine, August Mohaupt, Harry W. Dauer, Frank Martensen.

Improved Paper Machinery Corp.

Booth 267. Exhibit: 1½-ounce injection press molding 5-in. phonograph records.

Representatives: George W. Whitehead, Clark Galehouse.

Industrial Mfg. Corp.

Booth 160.

Instron Engineering Corp.

Booth 149. Exhibit: The Instron Tensile Testing Instrument, with extensometer and compressional accessories; the Instron Integrating Unit, a device for automatically obtaining the accurate time-integral of any desired function.

Representatives: Harold Hindman, George S. Burn.

The M. W. Kellogg Co.

Booth 137. Exhibit: Kel-F high temperature thermoplastic in molded, extruded and fabricated form.

Representatives: Walter J. Merck, Louis C. Rubin, Jules A. Jupa, Herbert B. Larner, Chester R. Leder.

Keppers Co., Inc., Chemical Div.

Booth 230. Exhibit: How to get the best results from polystyrene.

Representatives: D. M. Rugg, T. C. Keeling, Jr., M. C. Bailey, W. J. Mock, G. Thiessen, C. J. Snyder, M. J. Sills, E. H. Young, J. W. Pool, Jr., J. W. LaBelle, H. D. Cooper, H. C. Carlson, H. C. Baker, T. H. Cleavenger, K. D. Crooks, W. I. Steele.

W. T. LaRose & Associates, Inc.

Booth 115. Exhibit: High frequency heaters.

Representatives: W. T. LaRose, S. T. Miles, B. L. Singer, M. E. LaRose, J. L. Stratton, J. E. McCabe.

Lester-Phoenix, Inc.

Booth 215. Exhibit: Four-ounce machine in operation; various parts molded on this and larger pieces of Lester equipment.

Representatives; Nathan Lester, David White, William Schwartz, David Sloane, E. C. Mast, Harry Bollinger, Robert Groebel.

Livingstone Engineering Co.

Booth 261. Exhibit: Speedytherm boiler, using special heat transfer liquid instead of water to produce steam; other Speedyelectric steam generators and steam-jet cleaners.

Representatives: Bradley C. Higgins, F. J. Riker, John Waldroup, James J. Hickey, J. E. Hamilton.

Loma Plastics

Booth 262.

Lumite Div., Chicopee Mfg. Corp. of Georgia

Booths 216, 211. Exhibit: Lumite saran insect screening, upholstery fabric, automobile seat cover fabrics, and specialty fabrics.

Representatives: J. F. Nicholl, G. H. Day II, J. F. Rohs, G. V. Atkison, Edward White IV, Harold W. Brown, L. W. Maier Jr., J. W. Veeder.

Machine Design (Penton Publishing Co.)

Booth 113. Exhibit: Typical plastic parts specified by the readers of *Machine Design* for machines, appliances and equipment made by their companies.

Representatives: R. L. Hartford, H. H. Dreyer, R. K. Lotz, H. B. Veith, Colin Carmichael, J. W. Greve, E. F. Ross.

John Mack & Son Molded Products, Inc.

Booth 145. Exhibit: Folding drying rack and other proprietary items; custom injection, compression and transfer molded items.

Representatives: John Mack, Sr., Olga Mack, John Mack, Jd., Agnes Mack, Andrew J. Fischer, Mack B. Saizman, John Tarter, William H. White, Charles C. DeBruler, Richard Valentine, A. W. Colmery.

MacMillin Engineering Corp.

Booth 248. Exhibit: Electraulic power systems equipment for unit hydraulic press drives, including Electraulic power units with electric motor and integrally mounted high pressure axial plunger pumps, together with all pressure controls.

Representatives: Howard F. MacMillin, Norman F. MacMillin, Ray S. Conabee, Ervin P. Nelson, Philip W. Powell.

MacRay Engineering Co.

Booth 205:

Materials & Methods Magazine

Booth 213. Exhibit: *Materials & Methods;* technical books on plastics and related subjects.

Representatives: W. P. Winsor, Fred P. Peters, G. G. Hawley, T. C. DuMond, H. R. Clauser, Kenneth Rose, A. E. Fountain, F. J. McKinley, M. R. Long, D. W. Huettner, Bevin Smith.

Mayflower Electronic Devices, Inc.

Booths 239, 240

Representatives: Edward J. Wohlfarth, Jack Stewart, Robert Collins, Mrs. Ann Wohlfarth, Mrs. Virginia Smith.

Midwest Molding & Mfg. Co.

Booth 142. Exhibit: Custom and stock compression and injection molded parts.

Representatives: R. C. Bausples, T. E. Richards, Gustave Holmgren, James Loughman, Albert A. Fergin.

The Miskella Infra-Red Co.

Booth 206. Exhibit: Lamp-less and lamped Infra-Red sectional units and circular oven combined with vibratory vertical feeder for preheating thermoplastic granules.

Representatives: Wm. J. Miskella, Grace Miskella, F. J. Zitek, R. Sloan, John Hanson.

Modern Plastic Machinery Corp.

Booth 263. Exhibit: Extruders, dryers, conveyors, granulators, and special equipment.

Representatives: W. J. Johnson, Edward Tanis.

Modern Plastics, Inc.

Booth 129. Exhibit: MODERN PLASTICS magazine.

Representatives: Charles A. Breskin, Alan S. Cole, Hiram McCann, J. M. Connors, R. C. Beggs, M. A. Olsen, Norman B. Hasselriis, W. F. Kennedy, Fred B. Stanley, R. L. Van Boskirk, Warren H. Goodman, Val Wright.

Molded Products Corp.

Booth 251A. Exhibit: Phenolic custom moldings, featuring large pieces such as television cabinets.

Representatives: Dominic R. Siragusa, Frank J. Daley, Arthur Tomsak.

Monsanto Chemical Co.

Booths 153, 154. Exhibit: Case histories showing how plastics have overcome the traditional inertia against change in manufacturing materials and reformed operations profitably; a working demonstration of the newest method of coloring styrene.

Representatives: F. N. Williams, F. A. Abbiati, J. R. Turnbull, C. Lichtenberg, E. Kennedy, E. L. Hobson, C. Evans, R. Fordyce, C. Richards, J. W. Miller, F. Meuschke, W. A. Lang, D. B. McCammond.

Moslo Machinery Co.

Booth 144. Exhibit: Three-ounce Minijector, ¾ oz. hydraulic Minijector, and ¾ oz. hand Minijector molding machines; Moslo granulator.

Representatives: E. P. Moslo, B. J. Moslo, Harian Stanley, John Staszkowycz.

J. M. Nash Co.

Booth 162. Exhibit: The Nash Automatic Flash Lathe.

Representatives: A. Kluge, R. Bodendoerfer, G. McGuire.

Naugatuck Chemical Div., United States Rubber Co.

Booth 148, 150. Exhibit: Marvinol vinyl resins; Vibrin polyester resin; Kralastic molding powders.

Representatives: H. M. Parsekian, Earl S. Ebers, F. L. Hemingway, J. A. Herring, J. P. Chittum, W. C. Imholz, Willard Crater, H. C. Bendel, F. B. Molen, P. M. Elliott, C. W. Lawson.

New Hermes Engraving Machine Corp.

Booth 112. Exhibit: Portable and bench type machines for engraving, profiling, and vertical milling.

Representatives: N. Schimmel, H. Berman, J. Jaffe.

Nixon Nitration Works

Booth 117. Exhibit: Sheets, rods, and tubes made of cellulose acetate, cellulose nitrate, cellulose acetate butyrate, and ethyl cellulose; rigid vinyl sheeting; cellulose acetate and ethyl cellulose molding powder; and products made of these materials.

Representatives: W. A. Olsen, W. G. Tucker, A. J. Baldwin, F. W. Lindahl, G. L. Lotz, Mrs. M. Fahringer, M. W. Peters.

Nu-Dell Plastics Corp.

Booth 152C. Exhibit: Housewares, novelties, photo frames, wall decorations, and other proprietary items.

Representatives: A. A. Nudell, M. R. Sangerman.

The Ohio Rubber Co.
Booth 151. Exhibit: Versibond flexible decorative melamine laminate; molded vinyl plastic products.
Representatives: K. N. Carter, A. Weisheimer, G. L. Meyers, H. E. Stockfisch, C. A. Green, E. J. Nansen, J. H. Winchester.

Omni Products Corp.
Booth 226.
Representatives: Tino Perutz, G. L. Ottens, J. M. Ribas, F. M. Gottheimer, Miss Anne Ambes.

Owens-Corning Fiberglas Corp.
Booth 107. Exhibit: Plastic reinforcing mat and strands and some end-use products that use Fiberglas as reinforcing material.
Representatives: Ralph Perkins, Jr., G. K. Hammond.

Plaskon Div., Libbey-Owens-Ford Glass Co.
Booth 100. Exhibit: Three automatic compression molding machines specifically designed to mold Plaskon alkyd molding compound; applications of Plaskon urea and melamine molding compounds; applications of Plaskon alkyd molding compound.
Representatives: W. W. Knight, Jr., W. N. Shepard, Horton Spitzer, Henry W. Devore, James Ferguson, G. T. Walker, Donald Howland, E. David Caldwell, H. E. Murray, John Bygrave, George A. Taylor, Michael A. Brown, Jr., Alfred H. Egerter.

Plastics Engineering Associates
Booth 253.

Plastics Engineering Co.
Booth 235.

Plastics Industries Technical Institute, Dept. of West Coast University
Booth 114. Exhibit: Illustrations and literature detailing activities of university.
Representative: W. J. Dewar.

Plastics Industry
Booth 146.
Representatives: Ralph David, Robert A. Cooper.

Plax Corp. Div., Hartford-Empire Co.
Booth 225. Exhibit: Extruded thermoplastic sheet, rod and tubing, and end-uses for these materials; Plax-pak squeezable bottles.
Representatives: Henry E. Griffith, James Bailey, W. F. Ebling, Richard Muller, James H. Parliman, Paul Vogel.

Plymouth Industrial Products
Booth 256. Exhibit: Custom molded industrial applications of thermoplastics.
Representatives: A. J. Simmons, T. M. Mathews.

Product Engineering
Booth 218. Exhibit: *Product Engineering* magazine.
Representatives: Albert Hauptli, Adkins Lowell, Anson Meanor, John Tiebout, Philip Weatherby, Ray Deen.

Progressive Electronics Co., Inc.
Booth 253

Radio Receptor Co., Inc., Thermatron Div.
Booths 214, 216. Exhibit: Thermatron electronic heater units and products fabricated with those units..
Representatives: Ivan H. Schwartz, Harold Krongold, Walter Bauman, Walter Sparf.

Reed-Prentice Corp.
Booth 303, 304. Exhibit: Four ounce and 12-ounce plastic injection molding machines.
Representatives: F. W. McIntyre, Sr., F. W. McIntyre, Jr.

Regal Plastic Co.
Booths 118, 120. Exhibit: Projector carrying cases, surgical instrument cases, luggage shells, letters, washing machine tubs, signs and other items fabricated of acrylic, acetate, or Royalite sheet.
Representatives: J. S. Kivett, Homer I. Benson, W. C. Schlager, William L. Kelly, William A. Johnston, William B. Hoey, Clarence E. Webb, George E. Nelson.

Reichold Chemicals, Inc.
Booth 202A. Exhibit: End uses of various laminating and impregnating resins.
Representatives: Harry Kline, Mark K. Pinkerman, R. W. Thuemmler, J. C. Smith, G. Lamont, D. W. McArthur, J. M. Hafeli, J. L. Pool, L. T. Fay.

Respro Inc.
Booth 134. Exhibit: Resproid film and sheeting and finished products made of Resproid.
Representatives: Raymond S. Newell, John E. Manion, William H. Young, Jr., Albert J. Hanley, Fred R. Fitzpatrick, William W. Falencki, Nathan Cohen, J. C. Mooney.

Rohm & Haas Co.
Booth 102. Exhibit: Developments in the use of acrylic in lighting, signs, and storefronts; uses of acrylic molding powder.
Representatives: F. L. Fine, C. Bontempo, M. L. Brummer, D. S. Plume, D. A. Rothrock, F. L. Lynch, G. H. Sollenberger, F. W. Tetzlaff, N. G. Wedemeyer.

Alfred A. Rosenthal
Booth 243. Exhibit: Samples of products molded abroad with American-built molds; products and packages created with the guidance of U. S. models.
Representative: Alfred A. Rosenthal.

Santay Corp.
Booth 139. Exhibit: Television masks, escutcheons, dials, knobs, coil forms, and trim; radio cabinets, dials, escutcheons; automotive knobs, gearshift handles, dials; automotive sun visors.
Representatives: Daniel Szantay, Earl R. Keown, James Goulka, William Drake, Joseph Pedersen, George Timmings, William Timmings, Art Quelaser.

W. L. Stensgaard & Associates, Inc.
Booth 200. Exhibit: Plastics for retail store display promotions, manufacturer's identification, and displays.
Representatives: W. L. Stensgaard, A. C. Stensgaard, W. H. Stensgaard, E. H. Leeker, W. E. Herber, F. Trenk, Ed Lee.

F. J. Stokes Machine Co.
Booth 227. Exhibit: A 50-ton completely automatic molding press producing electrical parts; other plastic parts and the presses on which they were produced.
Representatives: A. A. Hutchings, E. S. Walker, F. N. Cramton, R. V. D. Strong, R. B. Anderson, S. S. Hellwell, D. E. Stokes, M. S. Adler.

Superdraulic Corp.
Booth 140. Exhibit: Superdraulic pump and valve equipment operating a transfer molding press on a completely automatic cycle.
Representatives: Robert E. Tamm, Leonard E. Meyers.

Superior Plastics Div., Commonwealth Plastics Inc.
Booth 116, Exhibits: Refrigerator, radio, and television set with plastic parts made by Superior; plastic lighting fixture parts made by extrusion and injection; houseware items made by extrusion and injection.
Representatives: R. W. Ebeling, C. McCormick, J. Edelston, H. Scheer.

Surprenant Mfg. Co.
Booth 217. Exhibit: Medical and commercial tubing, stripping, and extruded shapes; wire and cable; sheeting and film; plastic flooring.
Representatives: Albert H. Surprenant, George E. Forsberg, George E. Picard.

Susquehanna Mills, Inc.
Booth 245. Exhibit: Suskana saran fabrics for automobile seat covers; fabrics for upholstery; full-color rotogravure prints on Vinylite plastic; plastic woven rugs; Dynel (Vinyon N) work clothes, lampshades, and suitings; laminate trays.
Representatives: Peter H. Conze, John M. Byrnes, Margaret Hines, Howard Marks, Sam Janko, Gerald Rothbart, William Theissen, John Mast.

Tennessee Eastman Corp.
Booths 131, 132, 133. Exhibit: Plastic products made of Tenite; animated film sequence showing methods of injection molding and continuous extrusion.
Representatives: S. E. Palmer, D. C. Williams, W. F. Cooper, J. T. Bent, J. B. Williams, J. T. Moore, C. B. Fox, W. P. Gideon, N. R. Berini, H. D. Oliver, J. H. Dukes, E. C. Cathcart, C. L. Seay, J. G. Slater, G. W. Carpenter, W. P. Bussart, D. C. Guthrie, R. L. Bailey, A. B. Thurman.

Thermel Inc.
Booth 152A. Exhibit: Applications of tubular electric heaters such as cast-in aluminum band heaters, electrically heated platens, etc.
Representatives: Wm. H. Beall, Walter M. Morf, William H. Nagel, Barrett King, Sherry O'Brien.

Tuscony Fabrics, Inc.
Booth 106. Exhibit: Plastic prints and their end use, such as aprons, drapes, shower curtains, tablecloths, and yard goods.
Representatives: Kurt P. Reimann, Jack Thordsen, Alexander Kleine, Edward Jakowatz, Ernest Dikomeit, H. Stauder, Marion Stafford.

United States Chamber of Commerce
Booth 148.

United States Rubber Co.
Booth 254. Exhibit: Royalite sheet material; automotive parts, refrigerator parts, typewriter case, movie projector case, luggage, and other parts fabricated of Royalite.
Representatives: W. E. Faulk, D. W. Reed, R. L. Thompson, J. K. Johnston, V. J. Marik, R. L. Weiss.

The Van Dorn Iron Works Co.
Booth 234. Exhibit: Two-ounce injection press in operation; plastics scrap granulator in operation; articles being made profitably and economically on Van Dorn presses.
Representatives: J. J. Reichel, H. H. McNash, J. Vinmont, Jr., E. C. Maywald, M. Marina.

Victory Mfg. Co.
Booth 244. Exhibit: Molded parts used in the radio, automobile, refrigerator, and electrical industries; gift items, notions, toys, housewares, and other consumer items.
Representatives: Edward Singer, R. C. Pelz, H. D. Cooper, L. J. Anderson.

Watson-Stillman Co.
Booth 297. Exhibit: Injection molding machines, with special emphasis on the 48-oz. machines; plastics products molded on Watson-Stillman machines.
Representatives: E. A. Stillman, F. G. Helander, R. W. Dinzl, J. T. Gillespie, J. S. Wilson, A. J. DeMatteo, R. W. Schreck, R. E. Davis, R. A. York, R. F. Fehr, H. A. Genzken.

Welding Engineers, Inc.
Booth 168. Exhibit: Compounding extruding machinery.
Representatives: M. F. Loetterle, W. A. Schlosser, D. C. Spooner, J. R. Hannold.

Westinghouse Electric Corp., Micarta Div.
Booth 232. Exhibit: Decorative Micarta high pressure laminate.
Representatives: J. E. Callahan, G. F. Sutton, B. P. McGuire, W. C. Thrailkill, W. H. Hunt, P. Mixsell.

Yardley Plastics Co.
Booth 108. Exhibit: Extrusions and moldings, particularly tubing and parts fabricated from tubing.
Representatives: C. A. Ebner, W. E. Jacobson, R. W. Rosel, R. S. Stephens, R. J. Larson, R. A. Smith.

S. P. I.'s 4th Natio

EXPOSITION WEEK PR

Monday, March 27—6:30 p.m.
Sales Executives Club Dinner meeting, "Salute to Plastics," LaSalle Hotel

Tuesday, March 28—10:30 a.m.
Press Preview of Exposition, Navy Pier
1:00—6:00 p.m.
National Plastics Exposition, Navy Pier

Wednesday, March 29—10:00 a.m.
National Plastics Conference, Stevens Hotel
1:00—6:00 p.m.
National Plastics Exposition, Navy Pier

The Exposition will be held at the Navy Pier, Chicago, March 28-31. It will embrace displays by material makers, molders, laminators, extruders, and fabricators of plastics, builders of equipment and machinery for processing and handling plastics.

A Special Exhibit, sponsored by S.P.I. under the educational theme "Plastics Build Better Products and Better Values" will show over 100 case histories of products in which plastics have replaced other materials with resulting improvement in quality or salability or lower costs. There will be in this exhibit everything from automobiles to garden hose, from refrigerators to clothes pins, with the plastic parts on view for study and the economics of the applications clearly shown.

Industrial and Trade Users of plastics are invited: not the general public. Direct customers of the industry, users of plastic materials, purchasing agents, designers, engineers, store buyers, plastic product distributors, and all industry executives who are actual or potential users of plastics or plastics components will be able to see what's new and fundamental and to do business at the show.

Exhibitor's List begins inside fold, with a floor plan of the booth spaces and condensed information on what each exhibitor will feature and who will represent the company.

The Conference will be held at the Stevens Hotel, Chicago, mornings of March 29 and 30. Its theme will be "A Decade of Opportunity With Plastics". It will stress the market possibilities for plastics in the decade beginning now. All phases of plastics merchandising, selling, and distribution will be discussed.

March 29 Session will be under the chairmanship of Charles A. Breskin, Publisher,

ational Plastics Exposition and Conference

WEEK PROGRAM

7:00 p.m.
Banquet at Stevens Hotel.
Pageant: The March of Plastics

Thursday, March 30—10:00 a.m.
National Plastics Conference, Stevens Hotel.
12:30 p.m.
International Plastics Luncheon, Stevens Hotel.
1:00—10:00 p.m.
National Plastics Exposition, Navy Pier.

Friday, March 31—1:00—6:00 p.m.
National Plastics Exposition, Navy Pier.

MODERN PLASTICS and the *Modern Plastics Encyclopedia and Engineer's Handbook.* Speakers and their subjects are:

Alfred Schindler, president, Schindler Corp., St. Louis, Mo., the keynote address, "Selling—The Plastics Industry's Number One Job."

George D. Wever, director of promotion, *Life* magazine, "Where Will You Sell Tomorrow?"

Joel Goldblatt, president, Goldblatt Brothers Inc., Chicago, "Plastics Product Sales in Department Stores."

O. E. Norberg, manager of refrigeration and appliance engineering, Crosley Div., Avco Mfg. Corp., Cincinnati, Ohio, "What Crosley Has Done With Plastics."

March 30 Session will be under the chairmanship of Gordon Brown, vice president in charge of sales, Bakelite Div., Union Carbide and Carbon Corp. Speakers and their subjects are:

Dr. Nelson A. Miller, chief, Marketing Div., Office of Domestic Commerce, Department of Commerce, Washington, D. C., "Does Distribution Cost Too Much?".

Harold Van Doren, industrial designer, Van Doren, Nowland & Schladermundt, Philadelphia, Pa., "Sales by Design."

Ben Gordon, editor, Variety Store edition, *Chain Store Age,* "How To Sell Plastics Through Variety Chains."

S.P.I. Banquet will be held the evening of Wed. March 29, in the Grand Ballroom of the Stevens Hotel at 7.00 P. M. Toastmaster will be Horace Gooch, Jr., president of S.P.I. and treasurer and sales manager of Worcester Moulded Plastics Co. Guest speaker will be Tom Collins, public relations director of City National Bank and Trust Co. of Kansas City, Mo., whose subject will be "This Promising World." Following the banquet, the tremendous growth of the plastics industry, a growth which parallels the first 50 years of this century, will be featured in a special stage production called "The March of Plastics." Using the basic techniques of a television show, the five-part pageant will have a star-studded cast of radio and television actors, singers, and dancers to bring to life the story of plastics progress.

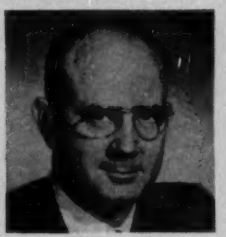
Guests from Overseas will enjoy a special international plastics luncheon at the Stevens Hotel on Thursday March 30.

Salute to Plastics will be the theme of a dinner meeting of the Chicago Sales Executives Club at the LaSalle Hotel Monday, March 27, the night preceding the opening of the Exposition. Speakers will be William J. Connelly, assistant director of public relations, Bakelite Div.; Horace Gooch, Jr.; and William T. Cruse, executive vice-president, S.P.I.

ALFRED SCHINDLER, Pres., Schindler Corp. Formerly: Gen. Sales Mgr., Ralston Purina Co.; Under Secretary of Commerce; Exec. Committee Member, National Distribution Council; Ch. of Bd., National Federation of Sales Executives; one of the greatest salesmen of this century.

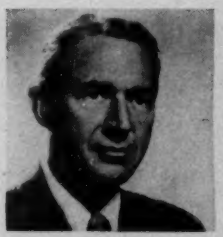
GEORGE D. WEVER, Director of Promotion, *Life* magazine since 1944. Formerly Vice President, Fuller & Smith & Ross, Inc. advertising agency. An expert in creative selling, he combines market knowledge with promotion. He will discuss markets for plastics in the decade now beginning.

JOEL GOLDBLATT, President, Goldblatt Bros., Inc., owning and operating fifteen department stores in Illinois. A leading authority on marketing and merchandising, he has bought and sold millions of dollars worth of plastics products and products with important plastic components.



O. E. NORBERG, Manager of Refrigeration and Appliance Engineering, Crosley Div., Avco Mfg. Co. has done more development work on plastics than most appliance engineering executives in the refrigeration and home appliance industry. Pioneered many major uses for plastics.

NELSON A. MILLER, Chief, Marketing Div., U. S. Dept. of Commerce. Twenty years experience in market research and distribution. Contributed to "Consumer Market Data Handbook" and "Market Research Sources." He is author of numerous publications dealing with market analysis.



HAROLD VAN DOREN, One of the most cost-conscious of modern designers, with a flair for sales and a sound knowledge of plastics. Author of book "Industrial Design, a Practical Guide," contributor to Encyclopaedia Brittanica. Past president of the Society of Industrial Designers.

BEN GORDON, Editor of Variety Store Editions of *Chain Store Age,* will present the results of two years research on visual selling and how to use it to boost your sales. He will analyze merchandising in "dime store" chains and show how to do bigger business with them.

SPECIFY

HOBBED CAVITIES
by MIDLAND

Home of the largest hobbing press in the plastics industry, Midland Die and Engraving is the ONE source qualified, equipped and manned to handle every Hobbed Cavity requirement—from the smallest tooth paste tube caps to radio cabinets, escutcheons and housings up to 80 square inches—nearly three times as large as ordinary hobbing limits. Typical examples of large hobbed cavities by Midland are the portable radio cabinet, radio cover and toy gunstock shown here. Midland engineering, experience and facilities are ready to serve you—ready to deliver *on time* uniform, accurate hobbed cavities at a fraction of machining costs. Specify Hobbed Cavities by Midland on *your* Bill of Materials. Or write for further information and estimates. No obligation.

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Makers of Plastic Molds • Die Cast Molds • Engraved Dies • Steel Stamps • Hobbings • Pantograph Engraving

Fully-Automatic Compression vs. Transfer Molding

by A. A. HUTCHINGS†

ED. Note: This frank discussion of the relative merits of two molding methods, often the subject of hot discussion, may help to settle many differences of opinion.

AS custom molding business becomes harder to get, and prices increase all around, the economics of molding thermosetting materials can certainly stand a searching scrutiny by all concerned. That such examinations are being made in many quarters is shown by the fact that hardly a day passes without the problem being presented to our company in one form or another.

During the past few years, the arguments in favor of transfer molding or plunger molding have taken on something of the aspect of a crusade—and rightfully so!

Savings With Transfer

Many molders have installed transfer molding presses as a means of reducing costs. With the advent of high frequency preheating, the savings in transfer molding were greatly increased, so much so, in fact, that many times the decision to use transfer molding on specific jobs was made without sufficient investigation.

Many of the transfer presses sold during this period are still performing at peak efficiency. In such cases, they are being used for exactly the classes of work in which transfer molding is necessary, and where no other type of press could do as well. In this respect, it is important to remember the prime reason for the original development of transfer molding. To quote the "1949 Modern Plastics Encyclopedia": "Transfer molding was developed to meet the demand for a system that would facilitate the molding of delicate sections and products with complex insert assemblies, or deep, small holes."

It was only natural that molders, when given high-frequency preheating and higher speed transfer presses, would use this combination for jobs other than those for which transfer molding was originally conceived. As a result, transfer molding has, among other things, made possible the economical production of heavy-sectioned parts.

But transfer molding is no panacea, as many molders have discovered, and it often fails to provide the economies anticipated. Nevertheless, some molders are continuing to use their transfer presses for simple jobs in an uneconomic way, just because they have the presses available.

As has been indicated, it would be to the advantage of all molders to view the pros and cons of fully-automatic compression molding vs. transfer molding. This discussion will, accordingly, point out in a completely objective manner just how each of these two methods of molding can be used advantageously, as well as suggest the shortcomings of each method.

In Favor of Transfer

First, the favorable reasons for transfer molding:

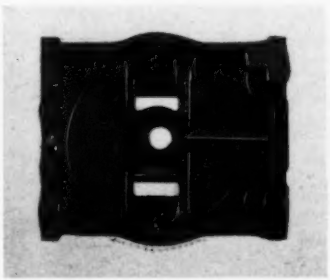
1). In those cases where extremely close tolerances are important, it is the better method.

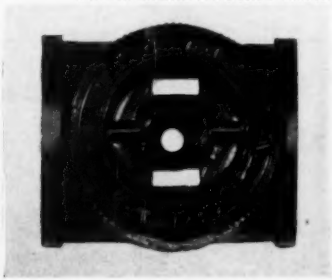
2). It is excellent, perhaps necessary, where delicate inserts are required, or where thin and/or complicated sections are involved.

3). It is indispensable where the abrasive action of the molding ma-

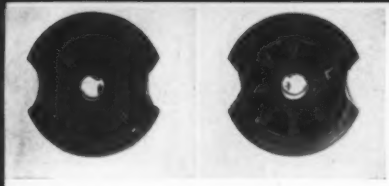
Case 1: Molding an electrical cube tap

ALL PHOTOS COURTESY F. J. STOKES MACHINE CO.





*Reg. U. S. Patent Off.
†Manager, Plastics Div., F. J. Stokes Machine Co.



Case II: Molding a miniature tube socket

terial on the surfaces of the forces and cavities in the mold will result in extremely short mold life.

4). It can virtually eliminate flash, which is a decided advantage on products which might otherwise require costly and difficult finishing.

5). It is much faster for thick-sectioned pieces.

Against Transfer

Among the factors which may be considered unfavorable to transfer molding are these:

1). The engineering of a transfer molding job is more complicated than for an automatic compression job, even though the operator of a transfer press may be only semi-skilled. By this is meant that the following factors, which are critical in a transfer set-up, must be given careful consideration beforehand and frequently modified as the job gets under way to insure satisfactory results:

a) Temperature of preform.
b) Pressure of main ram and transfer ram.
c) Ram speed.
d) Material selection.
e) Mold design, size of gates, runner design, location of cavities with respect to pot, etc.

2). Capital investment for transfer molding is higher than for automatic compression molding. The transfer press mold should be loaded with electronically or steam preheated preforms to obtain utmost efficiency. Therefore, a preheater and preform press, while not absolutely necessary, are certainly an aid to obtaining maximum economy from a plunger set-up; capital investment is increased accordingly. One type of fully-automatic compression molding press uses raw material as supplied in bags or drums and does not require either a preform press or preheater.

3). Maintenance of transfer molding equipment is greater. The cost of preforming as an aid to any molding operation where it is required is recognized as an expense frequently estimated at between 1½ and 2 cents per lb. of material processed. Also, the cost of running and maintaining an electronic preheater must be included in the total maintenance cost of a transfer molding job.

4). Preforming operations involve a considerable inventory of pills, which are subject to damage in handling and to the absorption of unpredictable and variable amounts of moisture, which, in turn, will upset established preheating and molding cycles.

5). Labor cost is higher because a full-time operator is required per press. With a fully-automatic compression machine, one man can usually handle several presses. This labor cost per thousand parts is so important that it is itemized separately in the case studies which appear below.

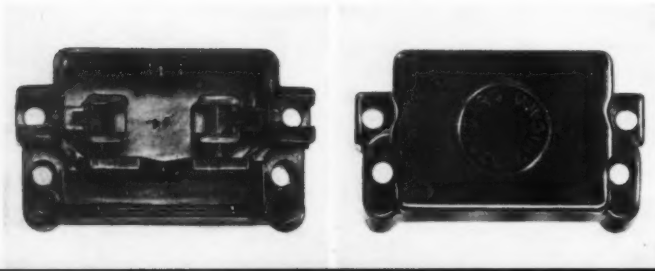
Table II—Production of a Tube Socket

	Molder "C"		*Molder "D"*	
	Transfer		*Automatic*	
Press	150-ton	$7,485	50-ton	$6,950
Preformer		$3,350	None required	
Preheater	2 KW	$2,500	None required	
Mold	15-cavity	$3,250	30-cavity	$5,600
Total investment:		$16,585		$12,550
Production per hour:		1,080		990
Labor Cost per M: (at $1.50 per hour)		$1.39		$ .15

Table I—Production of a Conventional Cube Tap

	Molder "A"		*Molder "B"*			
	Transfer		*Transfer*		*Automatic*	
Press	50-ton	$4,475	200-ton	$9,600		$6,950
Preformer		$3,350		$3,350	None required	
Preheater	2 KW	$2,500		$2,500	None required	
Mold	10-cavity	$4,500	16-cavity	$6,000	16-cavity	$4,600
Total investment:		$14,825		$21,450		$11,550
Production per hour:		600		960		1,150
Labor cost per M: (at $1.50 per hour)		$2.50		$1.56		$ .13

Case III: Molding a relay cover

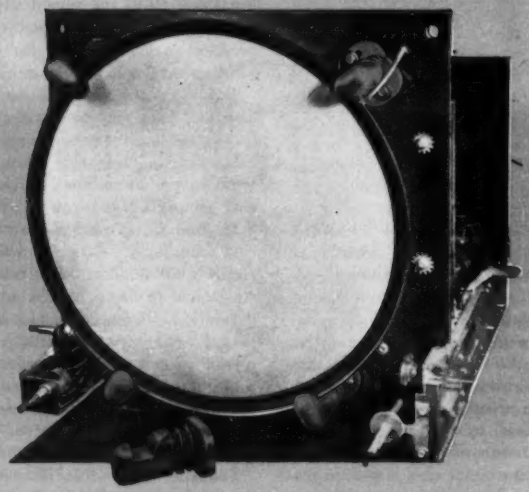


Absolute and Relative Factors

Some of the factors enumerated above are absolute and are true under virtually all conditions; others are relative and can be evaluated only by specific comparisons with automatic compression molding. Our company has been making such comparisons with the utmost care for about a year. It is imperative for us to know the facts, whichever way they point, if we are to supply the types of presses needed by the plastics molding industry. In our opinion, the four case histories given below represent a fair cross-section of hundreds of studies comparing transfer molding with automatic compression molding.

Against Compression

Of course, it must be understood that there are many plastic parts which cannot be produced satisfactorily by compression molding. If dimensional tolerances must be held



The television tube bracket is molded for Emerson by Plastimold, Inc., Attleboro, Mass.

PLASKON ALKYD CUTS COSTS 50%

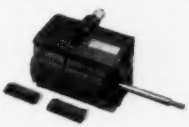
For Emerson Radio and Phonograph Corporation

Month-after-month . . . week-after-week . . . Plaskon Alkyd gains in acceptance and use. And it's no wonder! Just look at what Mr. Dorman D. Israel, Executive Vice President of Emerson Radio and Phonograph Corporation, has to say about this remarkable thermosetting plastic:—

"Plaskon Alkyd was selected for our television sets because of its superior mechanical and electrical properties, and particularly because of its outstanding electric arc resistance. *The cost of our molded brackets in Plaskon Alkyd is less than half the same or similar brackets molded of other similar performance material.* The Molded Plaskon Alkyd brackets are used to support and insulate the 16" metal cone television picture tube which carries 14,000 volts at the point where the metal cone is supported. When put into effect, this arrangement resulted in a substantial saving over the previous mounting. The use of Plaskon Alkyd by Emerson in this manner is the first such application in the industry."

Plaskon Alkyd has other advantages that are helping to build its acceptance with manufacturers. We would appreciate an opportunity to discuss them with you. Or, if you prefer, we'll send descriptive literature. Plaskon Alkyd may be the way for you to make some substantial savings or product improvements.

MADE OF PLASKON ALKYD, TOO



This is "The Standard Tuner" as used in Emerson television sets. It is made by Standard Coil Products Company, Chicago, Illinois, and Huntington Park, Calif. The parts are molded by Wilcox Plastics, Los Angeles; Mayfair Molded Products Company, Chicago; and Trans-Matic Plastics Co., Chicago, from Plaskon Alkyd.

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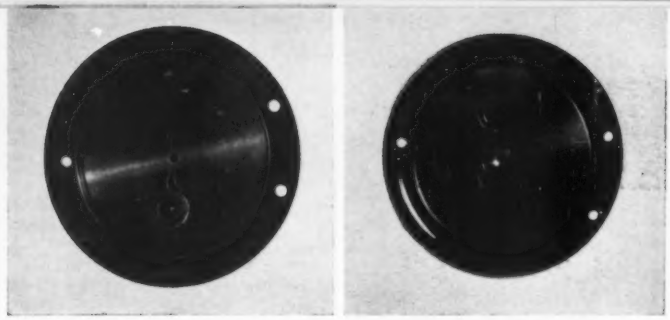


Case IV: Molding a fishing reel end-plate

accurately, if the part is of heavy section, if certain portions of the mold are fragile, or if flash must be held to a minimum, transfer molding is probably the only answer.

The following case histories refer to certain molded parts which can be produced either by compression or transfer without meeting any of the above-mentioned difficulties.

Proving the Points

CASE I. The piece involved is a conventional cube tap, produced in quantity for the electrical field. Molder A molds this part on a 50-ton transfer press, from a preheated preform. Molder B originally ran it on a 200-ton transfer press, using preforms, but subsequently changed to a fully-automatic 50-ton press, molding from powder, and now prefers the latter method because it is simpler, for the reasons given in Table I.

From the figures in that table, it is clear that transfer molding is a misapplication for this cube tap, because it provides neither minimum investment nor maximum production. And there is nothing so complicated about this cube tap as to require the extremely close tolerances available by transfer molding.

In one instance, Molder B preformed many pounds of material to run in his 200-ton transfer press, and after finding it would not work satisfactorily in the mold, was obliged to start over again with another batch of material. Unfortunately, he was out the time and cost of preforming, and his molded rejects ran very high, so that his customer was much upset. Because the transfer press required a full-time operator, the labor cost per thousand parts produced is much higher than for the fully-automatic method.

CASE II. A miniature tube socket used for all types of electronic equipment is something which many molders consider a troublesome piece because of the low-loss material specified and the thin pins forming the holes. Originally this part was produced on a semi-automatic compression press. Even slight carelessness by the operator resulted in excessive mold damage. Loading the mold was also a problem, because to obtain sufficient production to justify a full-time operator, it was necessary to run a very large number of cavities, some of which would periodically go out of production due to pin breakage. Until the recent development of a new-type automatic compression press, the only economical solution was transfer molding.

Two molders are now molding this identical part: one is doing the job on a 150-ton transfer press, the other one is using the latest automatic press mentioned above. The cost comparison is given in Table II.

Molder C (Table II) suffers a costly material waste in cull and runners, owing to the relatively small size of the part. The material is mineral-filled, and costs more per pound than a general-purpose phenolic, so this cost element is of more than usual importance. Preforming losses add to material cost and help make it excessive, in our opinion. Molder C considers it a "headache" job, while Molder D is quite satisfied. The difference in

(*Continued on p. 216*)

Terminal block at left must be transfer molded due to fragility of mold pins required for forming the square holes. Electric iron handle at right is molded on its side, and part forming recess is ejected from cavity by knock-out mechanism. Because of requirement for minimum amount of flash along parting line, as well as thickness of section, transfer molding is practically mandatory

This phenolic handle for a pressure cooker is molded on a 150-ton plunger press, and has a hole completely through the handle. Due to the small diameter of a portion of this hole, the pin would probably snap off if the part were compression molded. A requirement for a minimum of flash at the parting line is an additional reason for producing this part by transfer molding

Metallizing by High Vacuum

by MARVIN SCHNEIDER*

METAL coatings on plastics products to obtain various desired effects have proved a positive way to increase sales and reduce production costs. Through metal coatings, attractiveness can be enhanced, plastics design can expand into fields hitherto considered traditional to metal, lower priced plastic compositions can be utilized, inasmuch as the color is hidden, and many established plastic applications can be revitalized. With such finishes, outmoded designs can be recovered and savings made in mold cost. Metallizing is not new, but only since the introduction of the process known as "high vacuum metal evaporation technique" have the advantages and consequent savings become so pronounced as to make possible the economy of market applications in volume.

Metallizing Techniques

Among the different techniques in the field of metallization of plastics, the following have proved to be successful methods:

1. Vacuum Metallization
2. Silver Reduction
3. Electroplating

The relative merits of these methods are presented in Table I. The analysis is the result of a production investigation based upon a 4⅛- by 2½-in. cast phenolic plaque having very fine mold details.

The serviceability of the finishes are determined by the wearing qualities of the protective coatings used over the metal depositions. Numerous compositions have been developed to meet special service conditions.

Production experience has shown that vacuum metallization is the most advantageous method, with the silver reduction process the only method that can be considered nearly competitive. Both finishes have comparative service utility. Silver reduction has already reached the proportions of being fairly well established as a finishing technique. Cost considerations in a typical case history are shown in Table II. In the silver-reduction technique, the direct cost of the metallic silver was $.003 per unit. The majority of the metallic silver cost was in the waste solution, notwithstanding use of a recovery system. Analyses of many other cases have substantiated the results cited.

Developments in the high vacuum field have recently made possible the commercial application of evaporated metallic coatings to plastics. Brilliant, lustrous finishes are obtained on plastic components by this technique and include aluminum, copper, gold, Inconel metal, nickel, and silver. Metals are evaporated from sources in a high vacuum chamber and condense on all surfaces in direct line from the source. High vacuum is obtained by utilizing both mechanical and oil diffusion pumps.

Obtaining High Vacuum

The large mechanical pump (1 in Fig. 1) is used for the "roughing" work. During this phase of the pumping cycle, the oil diffusion pump system (2) is closed off from the rest of the unit. The roughing cycle brings the system down to a pressure of 75 microns, and the large mechanical pump is valved off. The diffusion pump is switched into the cycle by opening the pneumatic valve (3) and the large mechanical pump is valved into holding for the system. The small mechanical pump (4) is used as a holding pump primarily to maintain operating efficiency of the diffusion pump when it is closed off from the system. Production techniques require 0.5 to 5.0 microns pressure for evaporation. The operating limit of the diffusion pumps is approximately 0.001 microns.

The diffusion pump principles are as follows: Oil vapors boil upward as activated by the heating coil (5) and are then deflected downward by the jets of the three cone-like nozzles (6). The gas molecules from the chamber and connecting pipes spread into the top of the pump (7), and are forced downward by the jets. The oil vapors condense on contacting the water-cooled walls (8) and fall as a fluid to the bottom of the pump (9). The diffusion pump cannot discharge against atmospheric pressure, and consequently mechanical pumps "hold," picking up the exhaust gases.

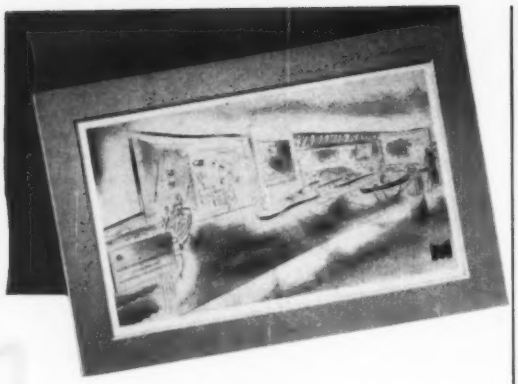
Fill-In Coats

Inasmuch as the appearance of the metal coatings is dependent

(*Continued on p. 138*)

Metallizing enhances the beauty of toys. Scrap or off-color material can be used to mold them, thus decreasing costs

*Consultant, Applied Engineering Associates, New York, N. Y.



Come in! Come in! Wherever you are!

Come In and See for Yourself

What's Being Done with Cyanamid Plastics

NATIONAL PLASTICS EXPOSITION SPE 1950 NAVY PIER CHICAGO MARCH 28-31

Above is just a rough sketch of the hospitality that awaits you in the Cyanamid exhibit at the NATIONAL EXPOSITION. Give us a chance to welcome you "in the flesh!"... any time from March 28 to 31.

We'll show you some of the outstanding products made with Cyanamid plastics . . . the most recent developments in molded BEETLE*. . . the rapid-selling MELMAC* Dinnerware . . . a complete series of resin adhesives for woodworking . . . durable, decorative MELMAC Laminates . . . AND the newest developments with LAMINAC*.

You may well discover how Cyanamid plastics can be used to build better products and better values for your company—*at lower cost!*

So don't forget! Booth 231. The display of Cyanamid-molded products *alone* will be well worth your while. And if you have a sales, merchandising or technical problem, let us have a crack at it with you. Together, we ought to be able to work it out. We will welcome the chance.

See you later! *®

AMERICAN Cyanamid COMPANY

PLASTICS DEPARTMENT
32 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

PLASTICS TODAY...

More and More; Better and Better

SINCE 1946 the total annual consumption of plastics materials has increased from 753,200,000 lbs. to 1,189,200,000 lbs.

Keeping pace with the over-all increase, the consumption of urea and melamine . . . thermosetting molding compounds . . . has grown from a lusty 52,000,000 lbs. in 1946 to a much lustier 112,000,000 lbs. in 1949.

The steady, healthy growth in the use of molded plastics is fostered by the enviable records they have established for appearance, performance, durability and economy (on the production line and in end-use). Today, manufacturers realize that by failing to consider the application of molded plastics to their own products, they may be in real danger of losing important ground . . . or they may be missing wide-open opportunities to *gain* ground on competitors, or to create broad *new* markets.

Compression molders of thermosetting compounds have now accumulated many years of practical experience in working with a wide range of materials. As a group they have the equipment and the capacity to produce for an increasing and imposing list of industries including automotive, aviation, electrical, communications, cosmetics and packaging. For manufacturers within these and other industries, compression molders today turn out parts with a speed and economy which only a few years ago would have been considered impossible or highly impractical.

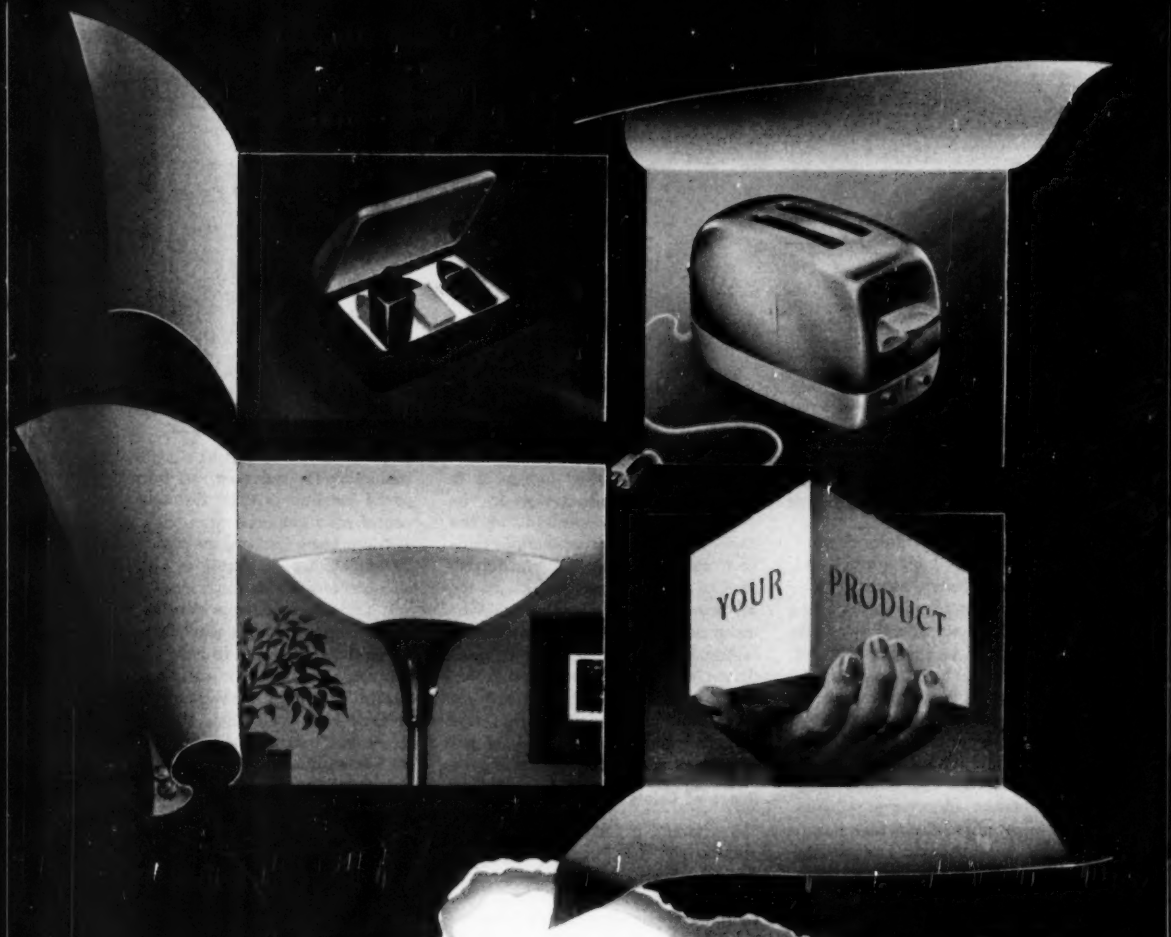
The advantages which molders help manufacturers pass along to consumers are manifold and have added compelling sales-appeals to many a marketing basket . . . color; texture; strength-with-lightness; easy cleaning; resistance to breakage, alcohol, cigarette burns, acetone, essential oils and common solvents. All these special properties and others too! And all of great value in many products ranging from dinnerware to distributor heads, from housings to buttons.

Backing up and working closely and consistently with the molders are some of the largest basic materials suppliers in the world. As a result, producers of end-products have at their disposal not only the molders' versatile know-how and capacity, they can also make free use of the research in design and applications available from raw materials people. Consequently, no manufacturer need be anything but absolutely certain that he will be supplied with molded plastics of the absolute best type and design for his specific purpose.

To keep abreast of this pooling of molders' and materials suppliers' technical experience and new developments, many top manufacturing executives currently rely heavily on literature distributed by producers of plastics raw materials.

One of the leaders among such publications is The Plastic News Front, published by The American Cyanamid Company. The growing list of those who regularly receive free copies comprises thousands of top-management, engineering, design and production executives. (Your request . . . on company stationery . . . will add you to the list.)

Molders, end-product manufacturers and consumers have realized the extreme importance of the research facilities and data offered by plastics materials suppliers such as American Cyanamid Company. Those facilities and data are vital reasons why the plastics industry, the materials it offers, and the end-products it makes possible are today's rich source for better products and better values.



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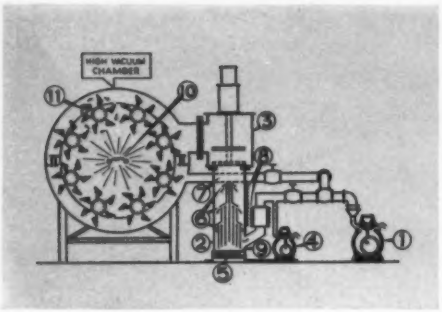
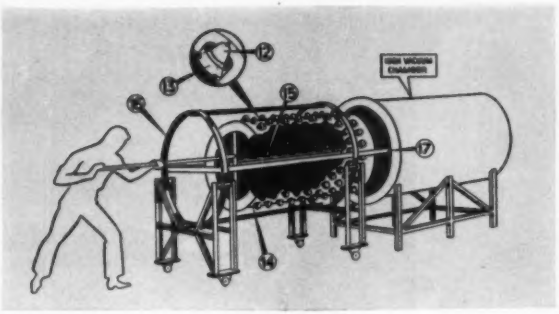


1—Schematic layout of high vacuum metallizing system



2—Loaded stationary holding fixture for high vacuum metal coating

upon the surface characteristics of the base upon which they are deposited, it may be necessary to employ fill-in coats of lacquers or varnishes to obtain high gloss, and hence highly reflective surfaces. Solvents may be employed to cause reticulation of the surface of the base plastic in order to obtain wrinkled and brushed finishes. All commercial techniques of application of these fill-in coats are satisfactory. Special consideration must be given to the formulation of these fill-in compositions, and particular care must be taken in order to insure complete dryness of the fill-in coat prior to the vacuum metallizing operation. The plastic compositions and the fill-in coating must have a low enough vapor pressure to allow the vacuum system to produce a pressure of 0.5 micron or less. Most of the plastic compositions fall into this category and, in general, this is not too stringent a limitation on commercial production.

Protective Top-Coat

The reference made to special formulation for fill-in coatings is based upon the consideration that after the deposition of the metal coating a protective topcoat is needed. Inasmuch as the metallic deposition is in the magnitude of 0.001 to 0.00005 in. thick, protection should be given to this film in applications where subsequent physical handling of the film might damage the metallic surface.

If the topcoat were to cause any swelling or reticulation of the base plastic or the fill-in coat, the appearance of the metallic film would be adversely affected. Consequently, formulations of fill-in coats and topcoats must be worked out so as to avoid any physical change in the metallic film as deposited. In the case of some plastic compositions (e.g. cellulose acetate), plasticizers tend to migrate upon aging into the fill-in coat, and care must again be taken to insure proper formulation of the fill-in coat to prevent plasticizer absorption. Commercial lacquers have been developed and are available for both under-coat and top-coat work for almost all of the plastic compositions.

Range of Colors

Variations in color tones of the metallic finishes are generally obtained by tinting the top-coat lacquers or by dyeing. A range of metallic appearance can be had by this technique, varying from all tones of gold through copper, and virtually including all colors of the total spectrum.

The metallic film need not be protected in instances where there will be no subsequent handling. Tarnish-free reflective surfaces can be prepared by this process through the use of aluminum.

Three basic techniques have been developed for application of high vacuum to metallization:

1. Objects held stationary within the vacuum chamber where coating is required on one side only.
2. Objects held by rotating jigs within the vacuum chamber. This method is used for irregularly shaped objects which require coatings over their entire surfaces.
3. Continuous lengths of material fitted on a rewinding mechanism within the vacuum chamber as in the case of continuous rolls of plastic films and fabrics.

Holding Fixtures

A stationary holding fixture that is basic in principle in all devices intended to hold plastic objects for one-side coatings is shown in Fig. 2. The plastic objects (12)—in this case ornamental Christmas bells—are inserted into individual cups

Table I—Comparison of Metallizing Methods

Technique	Vacuum metallization	Silver reduction	Electroplating
Appearance	excellent	excellent	very good
*Utility**	very good	very good	excellent
Unit cost	$.03	$.07	$.14
Remarks	Physical details maintained. Service utility of finish dependent upon protective lacquers used. Brightness of finish unaffected by aging.	Physical details maintained. Service utility of finish dependent upon protective lacquers used. Brightness of finish affected by aging.	Physical details blurred. Service utility of finish excellent. Brightness of finish may be affected by aging.

*Evaluation of the factors that determine the functional value of the item, including permanence of finish under service conditions, weight, protection afforded to the plastic item, etc.

(13) retained by the fixture wall (14). The cups align the plastic bells so that the center axes of the bells are directed inward towards the sources (15). This completely masks the outside of the bell and permits metallization of the plastic bell interior only. The fixture is held in the dolly ring (16). This makes for ready loading by the operator.

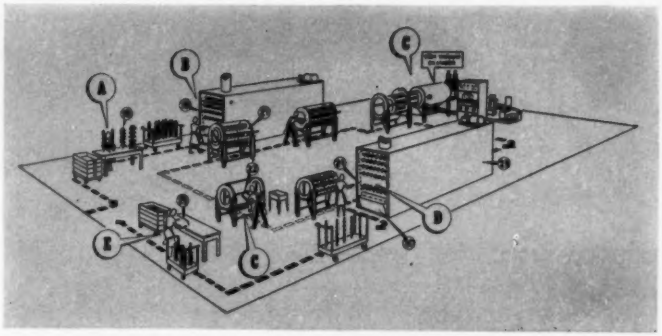
Inasmuch as the most economical methods utilize dipping techniques for application of the fill-in coats and top-coat lacquers, the system illustrated in Fig. 3 includes dipping machines.

The work carrying rack throughout all operations is the "riser-rod" to which the individual plastic pieces are attached (18) by spring clips. The angle of attachment is predetermined to eliminate any accumulation of lacquers in reverse-curved horizontal sections. The loaded riser-rods are then transferred into the automatic dipping machine (19). Here a chain conveyor, with special attachments to hold the riser-rods, carries the work into the lacquer bath. Under controlled conditions of extraction-angle and rate, with fixed viscosity of the lacquer, the pieces are withdrawn free of flow-marks and tears. The chain conveyor carries the work into the oven tunnel. Here controlled temperature forced drafts dry the coatings for approximately one hour. The dried coated work is removed by the operator and loaded into the station-holding fixture.

Work is Rotated

The station-holding fixture (21) is the mechanism that carries the rotating stations on which a multiple number of riser-rods are loaded. A typical fixture would consist of seven to eight rotating stations. Each station is capable of carrying up to 12 riser-rods. Each station spins on its own axis, and all are tied together by sprockets and chain drive. At the center of the station-holding fixture is the source assembly (22); these sources are generally tungsten or molybdenum filaments spirally wound. High amperage is passed through the filaments, generating sufficient heat to volatilize the particular metal which has been loaded into the spiral.

The rotation of the riser-rod by the swing of the station generally exposes all sides of the plastic objects to the source of the metal.



3—Basic labor stations: A) Loading riser-rods. B) Loading and unloading first dipping machine; riser-rods to holding fixture. C) Loaded assembly into vacuum chamber; metal evaporation; unloading chamber; dolly to second dipping machine; load filament sources after D removes riser-rods. D) Loading and unloading second dipping machine; riser-rods to E. E) unloading finished work

The station-holding fixture is carried on a dolly from the dipping machine to the vacuum coater. Here the station-holding fixture is slid into the chamber by means of a guide track (17, Fig. 2). The station-holding fixture drive pulley shaft engages a clutch on a rotary shaft coming through the far end of the vacuum chamber wall. The source assembly makes contact with electrical terminals mounted in the vacuum chamber. The door is closed and the pumping cycle begins.

Metal evaporation from the sources is begun at 0.5 microns pressure. Station rotation is activated prior to the evaporation and continues for a short interval afterwards. Air is then let into the chamber and the chamber door opened.

The station-holding fixture is now pulled out onto the dolly and the entire assembly is wheeled over to the second automatic-dipping machine (23, Fig. 3). Here the operator removes the metallized riser-rod and work, and loads the units onto the chain conveyor (24). This dipping machine applies the protective topcoat from the bath (20).

When the station-holding fixture is unloaded, the source filaments are reloaded with the evaporating metal. The assembly is then wheeled over to the first dipping machine for reloading.

The operator of the second dipping machine removes the top-coated riser-rod and work, and transfers the unit to the stripping station (25). Here the finished work is removed from the riser-rods. The stripped riser-rods are then transferred to the assembly table (18) where the initial operations are begun again.

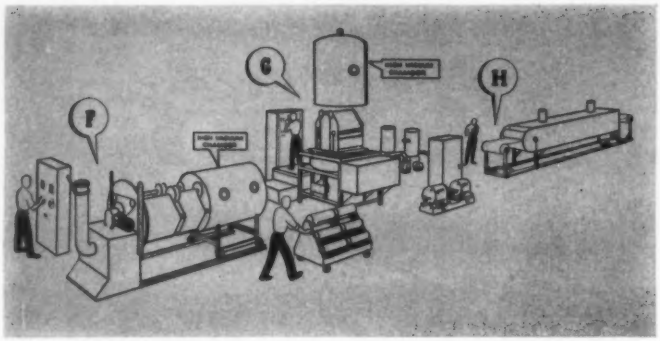
Economics

A typical system as described above would require approximately 1500 sq. ft. of operating space. It would consume, on an average, $3 power per hour. When kept in full production it would use approximately $7 worth of raw materials per hour.

The production capacity of these

Table II—Coating Cost Comparisons

	Silver reduction	*Vacuum metallization*
Production volume per day	300 gross pieces	300 gross pieces
Initial capital equipment investment	$20,000	$28,000
Labor required	28 man days	9 man days
Total direct costs	$.013 per unit	$.003 per unit



4—Basic steps in roll-coating by vacuum metallization

complete high vacuum systems is gaged by the productivity of the vacuum chamber. Under most favorable conditions, three cycles per hr. can be obtained. The number of pieces that can be loaded into the vacuum chamber per cycle is a function of the volume occupied by the object. In the instance of a vacuum chamber 48 in. in diameter by 48 in. long, the following are typical cases:

Assuming small objects, #30 ligne novelty buttons, to be the work involved, 12 riser-rods can be loaded per station, and there are eight stations per holding fixture. This would then require 288 riser-rods per hour. Forty buttons per riser-rod loading would accumulate 11,000 per hour. For this volume, automatic riser-rod loading and unloading devices would be desirable. Otherwise 11 workers would be required at both stations A and E, stations B and D would require two workers each, and station C one worker—a total of 27 workers.

A more representative case would involve toy pistols, of such size that would permit seven pistols per riser-rod and six riser-rods per station. This would accumulate 1000 units per hour. This volume would necessitate two workers at station A, one worker at station B, one worker at station C, one worker at station D, and two workers at station E, or a total of seven workers.

Roll Coating

In Fig. 4 is shown the flow of work for continuous roll coating. Continuous lengths of plastic films and synthetic fiber fabrics can be metal coated on one or two sides as needed. In many lightweight transparent film applications such as tinsel foil for packaging, one-side metal coatings without any protective topcoats are satisfactory. The scheme of work illustrated includes the means of application of the topcoat lacquers.

At station F (Fig. 4) is the vacuum-treating machine. The purpose of this unit is to degas the continuous roll before it goes into the high vacuum metal coater, station G. In station F, the continuous film or fabric is rolled forward and backward with photo-electric reversing on the rolling mechanism until sufficient gas is removed from the roll to insure a proper cycle in the high vacuum metal coater.

Station G is a typical unit having a capacity of 1500 ft. of 20-in. wide 0.0075 acetate. The coater will coat the sheet with aluminum at a rate of at least 20 ft. per min. and will require about 15 min. to reach the operating pressure. Allowing time for loading and unloading, the cycle will be approximately 1½ hr. per 1500-ft. roll.

The protective top-coat is applied at station H. The film passes through a roller coating unit and is then carried into the oven tunnel. After a sufficient drying period, the web is re-rolled on a far end.

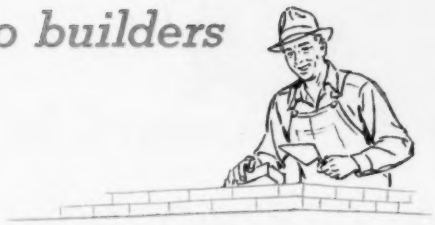
The estimates in Table III indicate the costs of operation of the equipment per square foot of coated acetate sheeting. The electrical costs were figured on the basis of $.05 per kilowatt hour and the water at $.20 per thousand gallons. Since the data in this table have allowed a considerable proportion of the cost as a contingency factor, the figures should be regarded as maximum rather than minimum. Also, where electric rates are lower than $.05 per kilowatt hour, the figure given will be correspondingly reduced.

Applications of vacuum metallization have included: cellulose acetate, cellulose nitrate, cellulose acetate butyrate, cellulose propionate, polystyrene, methyl methacrylate, polyethylene, polyvinylidene dichloride, nylon, and most thermosetting compositions. Products have included optical frames, chessmen, buttons, escutcheon plates, toys of all types, trumpets, trophy cups, flower pots and vases, jewelry cases, plaques, radio housings, card boxes, razor-blade dispensers, religious articles, flashlight reflectors, Christmas ornaments, nameplates, light-switch shields, costume jewelry, and many other items.

Table III—Costs of Metallizing 0.0075 in. Acetate Sheet

120 kw. hours on the coater per 1500-ft. roll, and 37 kw. hours per roll on the degasser, making a total of 157 kw. hours per roll at a cost of	$7.85
Water consumed by the coater itself per roll is approximately 210 gal. or	.06
Water consumption on the degasser per roll is again approximately	.03
The crucible material may run as high as $5 per sheet	5.00
Total of electrical, water, and material cost	$12.97
Operator cost, approximately	6.00
Total operating cost	18.97
Maintenance, supplies, and other contingencies	6.03
Total cost per roll	$25.00
1500 ft. of 20-in. wide acetate is 2500 sq. ft. per roll: therefore, the cost per sq. ft. of metallizing is	.01
The cost of material per sq. ft. varies between $.046 and $.048; $.05 per sq. ft. is allowed as an outside figure	.05
Total cost of metallizing one sq. ft. of acetate sheet	$ .06

boon to builders



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Role of Pressure, Temperature, and Time in the Injection Molding Process†

by G. D. GILMORE and R. S. SPENCER††

The rapid expansion of the injection molding process has resulted in considering it as an art. With present-day and future demands, it must be recognized as a science and as involving scientific principles. Knowing these principles, the true factors controlling quality and quantity can be easily regulated. The thermal expansion and pressure contraction of thermoplastics are fundamentally involved in the molding process. By measuring directly the pressures involved in the formation of a molding, it is possible to explain, through scientific principles, the results observed. A great deal more work remains to be done to explain all the results obtained, and eventually to be able to specify conditions for a specific molding job.

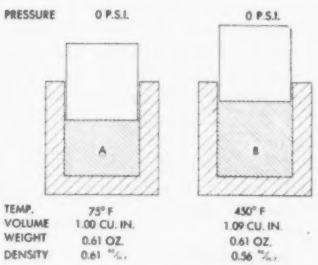
FOR 20 years, the injection molding process has been a means of fabricating thermoplastics. Its development in the past 10 years has resulted from trying one thing after another until one or more gave some measure of success. Too often, these experiments have been costly and have failed to yield any great amount of knowledge of the fundamental principles involved. Perhaps, because of its rapid expansion and apparent wide range of operating conditions, there was little need for knowing the "why" of the results obtained. As the development of this process continues—with the trend toward larger and more complicated moldings, faster production rates, and greater precision—the problems are less easily solved by past experience. To meet these demands, it will be necessary to realize that the injection molding process can no longer be treated as an art. It must be understood that certain fundamental principles are involved which will explain results and lead to better methods of operation.

This method of fabrication involves many variables such as pressure, temperature, time, gate size, etc., and nearly all are interdependent. Thus, if we change one variable, it may, in effect, change one or more of the others, which in turn may cause the observed result. Also, of all the variables remaining with a given machine, mold, and plastic, only time is generally measured directly. Such items as temperature and pressure are known only indirectly through cylinder temperature and oil pressure. In order to analyze the process, it is necessary to measure such variables directly.

It is the purpose of this paper to 1) review some of the known characteristics of thermoplastics, in particular, polystyrene, and how they form the basis for a better understanding of the process, and 2) to discuss a method of measuring plastic pressure in the mold and to show how such measurements with polystyrene permit a detailed analysis of the process.

Cubical Thermal Expansion

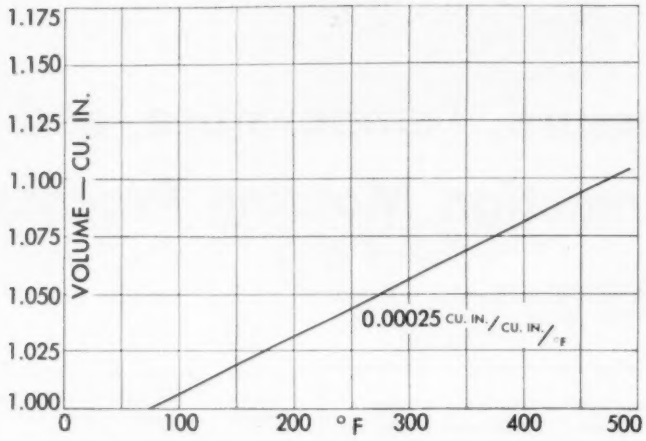
A thermoplastic, like most other substances, will expand in volume as its temperature is raised, provided that it is not restrained. This expansion is defined in terms of a coefficient of cubical thermal expansion, or the increase in volume of each unit of volume for each degree of rise in temperature. Referring to Fig. 1, A is a mass of polystyrene at room temperature in a cylinder shown in cross-section. It occupies a volume of 1 cu. in. and weighs 0.61 ounces. By applying heat



1—Thermal expansion of thermoplastics. Greater heat increases volume of polystyrene mass from A to B

*Reg. U. S. Pat. Office
†Presented at a meeting of the Research Committee of A.S.T.M. Committee D-20 on Plastics in New York, October, 1949
††Styron Control and Development Laboratories, Dow Chemical Co., Midland, Mich.

and raising the temperature to 450° F., its volume is increased to 1.09 cu. in., as shown by B. Note that the density has decreased from



2—Polystyrene thermal expansion characteristics. To find equilibrium volume at any temperature, coefficient of 0.00025 cu. in. per degree F. is applied. Curve graphically illustrates changes brought about by adding heat in Fig. 1

0.61 oz. to 0.56 oz. per cu. in., while the weight remains at 0.61 ounces. This characteristic of polystyrene is shown graphically in Fig. 2, where equilibrium volume is plotted against temperature from room temperature through the normal molding temperature range.[1] The actual volume at any temperature up to the region of 250° F. will vary, depending on the rate of heating. In the normal molding temperature range, actual volumes for various heating rates are, for all practical purposes, at equilibrium. To determine the volume at any temperature in the molding range, a volume expansion coefficient of 0.00025 cu. in. per cu. in. per degree Fahrenheit may be used.

Compressibility

Thermoplastics also decrease in volume when placed under pressure. The volume of a mass of polystyrene at 450° F. can be decreased as much as 6.8% under a pressure of 16,000 p.s.i. Referring to Fig. 3, B is the same mass of polystyrene as B in Fig. 1. If this mass of polystyrene is subjected to a pressure of 12,000 p.s.i., with no change in temperature, the volume will be decreased as shown by C, to 1.034 cu. inches. Its density will be increased to 0.59 oz. per cu. inch. The volume, under higher pressures, will approach the 1 cu. in. which the sample occupied at room temperature and zero pressure. This characteristic is also shown graphically in Fig. 4, where volume is plotted against pressure for various temperature levels.[2]

The effect of both temperature and pressure on the volume of polystyrene in the normal molding range can be summed up in one single equation of state,

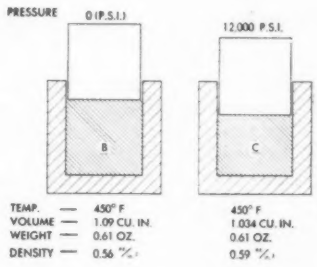
$$(P+27{,}000)\,(V-1.422)=11.18T+5134$$

where P is the external pressure in p.s.i., V is the specific volume in cu. in. per oz., and T is the temperature in degrees Fahrenheit. Thus, with any two of the quantities known, the third can be calculated. This relationship between pressure, temperature, and volume forms a basis for a better understanding of the injection molding process.

Simplified Injection Molding Cycle

Having an understanding of the above characteristics of the thermoplastic, it becomes an easier matter to build a general picture of what occurs in an injection molding cycle.

Figure 5 pictures the sequence of events in a simplified injection molding cycle. In this picture, consideration is given only to basic principles involving the pressure, temperature, and volume of the thermoplastic, which is in this instance, polystyrene. In A is shown the empty mold of 1 cu. in. volume, and a cylinder at room temperature containing 1 cu. in. of polystyrene. At B, the plastic has been heated to 450° F. with zero pressure, increasing its volume to 1.09 cu. inches. At C, a pressure of 12,000 p.s.i. has been applied to the polystyrene, filling the mold. The effect of mold temperature is neglected since it does not change the basic principles involved. Mold temperature, however, would be an important factor to consider in a more comprehensive analysis. This pressure has reduced the volume of polystyrene to 1.034 cu. in., of which 1.00 cu. in. has entered the mold, leaving 0.34 cu. in. remaining in the cylinder. The volume of the passage between the cylinder and the mold may very well be neglected because of its usually very small size. In D, the mold and cylinder have separated, due to the gate freezing off, and the polystyrene in the mold has cooled to room temperature. One cu. in. of the polymer at 450° F. and 12,000 p.s.i., when cooled to room temperature and at zero pressure, will occupy a volume of 0.97



3—Increased pressure on polystyrene, B, decreases volume to mass C

cu. inches. This difference between the volume of the molded piece and that of the mold cavity at room temperature is "mold shrinkage".

Notice that the weight of the

[1] R. S. Spencer and R. F. Boyer, J. App. Physics 17, 398-404 (May 1946).

[2] R. S. Spencer and G. D. Gilmore, J. App. Physics 20, 502-506 (June 1949).

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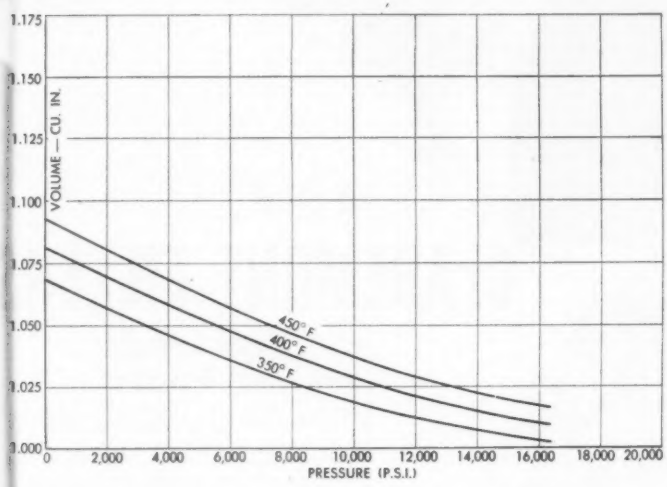
polystyrene in the mold, C and D, has remained the same; only volume has changed, bringing the density of the polystyrene to 0.61 oz. per cu. in. at D. In going from C to D, the temperature has decreased, causing the pressure to decrease at the same rate. If the molding had been cooled in a perfectly uniform manner, the cube would be a perfect image of the cavity, only less in each linear dimension by approximately 0.010 inches. Such uniform cooling is very difficult, if not impossible, to obtain in practice, and therefore, each linear dimension may be smaller by a different amount. The greater portion of the difference in volume is exhibited as sink marks in the molding, especially in the heavier sections. Figure 6 pictures the mold filled with polystyrene at A, 12,000 p.s.i., and B, 15,000 p.s.i. Note that the weight in B is greater than the weight to A, and, likewise, the final volume in D is greater than in C. In terms of appearance, the molding C will have more prominent sink marks. At the same time, however, molding D will have more nearly the dimensions of the cavity. At higher pressures, the molding approaches the dimensions of the cavity, and release becomes very difficult and may even freeze the mold closed.



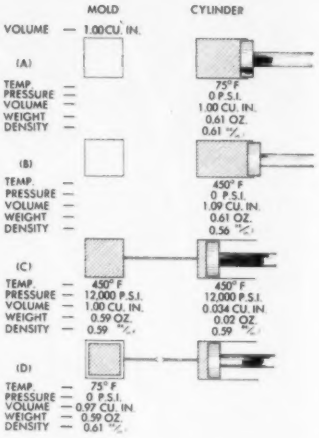
4—Volume-pressure relationship for polystyrene at varying temperatures. At higher pressure, volume approaches the 1 cu. in. it occupied in mass A, Fig. 1

Mold Pressure Measurement

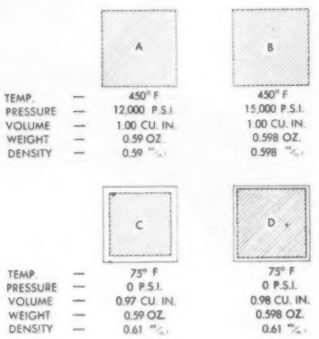
One of the important considerations in the analysis of this process, as was pointed out in the preceding discussion, is to know the pressure existing in the mold cavity. A production-type mold was fabricated to permit such measurements. As much flexibility as possible was built in to permit easy changes in sprue runner, gate, and cavity design. A box was selected as the object to be molded, with dimensions of 4 by 4 in. and a 2.500-in. draw. A gate was selected of dimensions 0.035 by 0.375 in. with no land length. A wall thickness of 0.170 in. was arbitrarily chosen, with provisions for other wall thicknesses through interchangeable core inserts. This gave a shot size of 6 ounces.

A photograph of the back half of the mold is shown in Fig. 7. The cooling lines for the core can be seen projecting through the cavity insert plate. These lines lead directly to the core. The core was completely milled out within ½ in. of the surface to permit accurate core surface temperature control. The runner and gate were built in a special removable runner pad which gives flexibility in gate and runner design.

The front half of the mold is shown in Fig. 8. Here, again, generous cooling passages on all sides of the cavity give close surface temperature control. The pressure pick-up device is shown mounted in the cavity insert. The pressure head was designed for this mold and permits operation of the mold in a



5—Sequence of events in an injection molding cycle, highly simplified



6—Effect of pressure on weight and volume of polystyrene-filled mold

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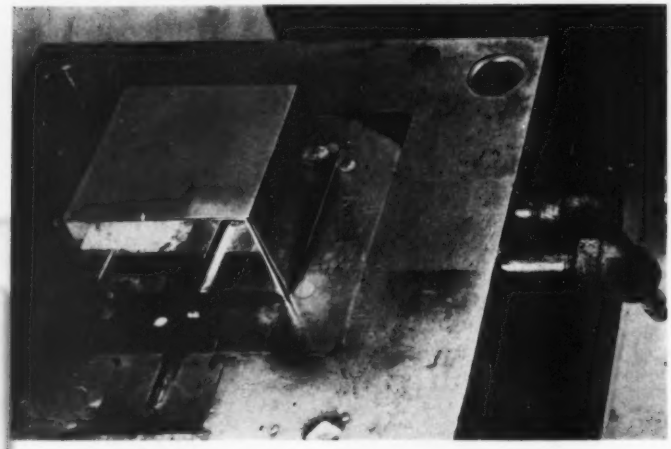
Mounting features of this pressure head are shown in Fig. 9. The pressure against the cavity wall is transmitted to the pressure head through the small plunger, A. This plunger is necessary in order to protect the pressure head from a temperature gradient along its length. The pressure head, B, consists of a steel cylinder closed at the end C with a flange, D, which is rigidly fastened to the cavity insert. A force on face C of this cylinder produces a strain which is transmitted through a small rod inside the cylinder. Strain gages are mounted between this rod and the flange. Thus, a force on the cylinder is converted to an electrical signal by the strain gages. This signal is amplified, rectified, and indicated on a DC milliammeter or recorded through an L & N Speedomax recorder. The maximum mechanical movement in the system for 30,000 p.s.i. pressure in the cavity is only 0.0015 inches. This means of measuring cavity pressure is accurate to approximately ±0.5% of full scale reading, and response to pressure changes is very rapid. By this means, it has been possible to measure and record directly mold pressure against time during the molding cycle. These measurements have been made while operating at production rates with a conventional mold in standard type machines.

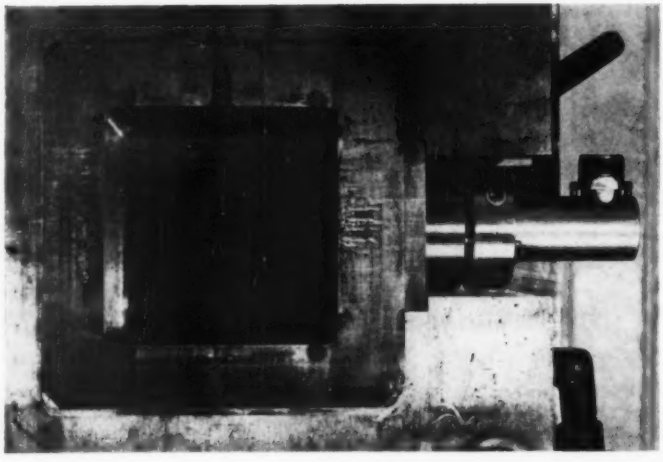


7—Back half of production-type mold made to illustrate mold cavity pressure measurement. Cooling lines for core are seen projecting through insert plate

Of first consideration is the relationship between machine pressure and the maximum mold pressure, hereinafter called the "injection pressure". Figure 10 is a plot of injection pressure against machine pressure at various injection temperatures (temperature of the plastic entering the mold). Under the conditions of operation where the machine is running at 50% capacity on a 60-sec. total cycle, the maximum injection pressure at an injection temperature of 490° F. is 13,000 p.s.i. The injection pressure falls off rapidly to 3,000 p.s.i. at a machine pressure of 10,000 p.s.i. Raising the injection temperature from 450 to 490° F. at a ram pressure of 12,800 p.s.i. increases the injection pressure from 4,000 to 7,200 p.s.i. From this, it is evident that the injection pressure is not only dependent on the machine pressure, but also on the injection temperature. Other measurements have shown that injection pressures can be increased by: 1) lowering the molecular weight of the polymer; 2) surface lubrication of the granular polymer; 3) increasing the rear heater temperature setting; 4) internal lubrication of the polymer; and 5) changing the dimensions of the flow passages, such as the gate and tunnel, to reduce resistance to flow. These factors will not be further discussed in this paper.

The pressure drop is largely the result of flow through the system and, to some extent, the granular polymer ahead of the ram. During the pressure cycle, starting with the filling of the mold and until the gate is frozen, polymer is continually flowing either into the cavity or

8—Front half of pressure box mold with pick-up device mounted in cavity insert. Cooling passages on cavity sides give close surface temperature control



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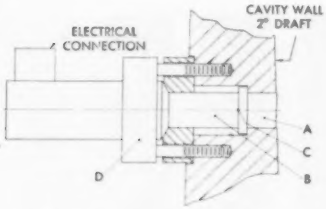
into the tunnel. The flow rate reaches a peak during filling and approaches zero as the gate freezes. At no time during this period does a static condition exist. With flow present, it is only reasonable to expect a pressure drop.



9—Mounting features for pressure head. Accuracy of cavity pressure measuring system is about ±0.5%

Mold Pressure Cycle

While the pressure efficiency of the machine and polymer are of great importance, it deals only with one instant of time in the molding cycle. It is necessary to know how the pressure in the mold varies during the cycle to clearly understand the process.

Figure 11 shows one recorded mold pressure cycle. The vertical axis is the pressure scale, and the horizontal axis is the time scale. Note that the cycle consisted of 13 sec. of plunger forward time and 22 sec. of mold closed time. The pressure cycle has been broken down into periods of time, A through F. The mold was closed and the plunger started its forward motion at point 0. The "dead time", A, is the time before the polymer started flowing into the sprue hole. In period B, the polymer flowed into the mold and filled the cavity. As soon as the cavity was filled, the polymer in the cavity began to cool. During the time C, pressure was built up in the mold to the injection pressure. In the "packing period", D, which includes the pressure build-up, C, polymer flows into the cavity at a relatively slow rate.

The fact that flow occurs during the packing period is easily understood when one recalls that the polymer is compressible and that heat is being removed from the polymer through the cavity walls. For each increment of pressure placed on the polymer in the cavity, its volume tends to decrease. This allows more polymer to enter the cavity. Likewise, for each increment of temperature drop, the polymer tends to occupy less volume which allows more polymer to enter the cavity. These two characteristics, combined, may allow flow into the cavity at a rate of 1 g. per second.

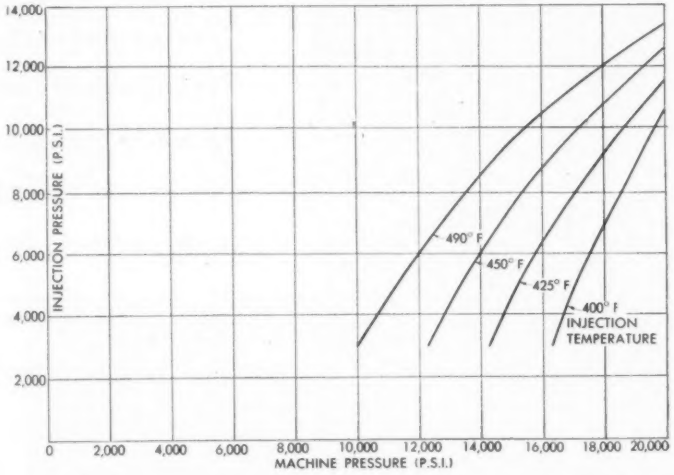
The plunger forward time ends and the plunger returns, ending the packing period. At this instant, the polymer in the gate is still relatively fluid, and with zero pressure on the tunnel side and slightly less than injection pressure in the cavity, the flow reverses. Polymer now flows from the cavity into the tunnel. This period, E on the curve, has been called the "discharge". It is evidenced by the fact that the pressure drop immediately after the plunger starts its return is much greater than can be accounted for from cooling alone. The flow rate at the start of the discharge is very high, but it decreases very rapidly to a point which allows time for the polymer to freeze at the gate. The pressure remaining in the cavity at the instant the gate freezes has been called the "sealing pressure". This pressure is easily determined since the pressure decay rate equals the cooling rate as soon as the flow through the gate reaches zero.

During the period F, cooling continues in the cavity with no flow in either direction through the gate. At the end of the mold closed time, the mold opens with some pressure remaining in the cavity. This pressure has been termed the "residual mold pressure". It is this pressure, as will be shown later, that causes scoring or cracking of the molding at release.

In the mold pressure cycle, we have what might be called a history of the pressure, temperature, and time variables in the formation of the molding. With it, a general analysis of the mechanism of the formation has been shown, but at the same time it affords a clear understanding of the effects produced by the machine controls.

One of the very critical machine controls is the plunger forward timer. With this one control, many varied results can be produced in the molding. How the plunger forward time can affect the mold pressure cycle is shown in Fig. 12. To obtain these pressure cycles, only

(*Continued on p. 218*)



10—Machine pressure efficiency determined at varying temperatures of plastic entering mold, using a 6-oz. shot in a 12-oz. machine on a 60-sec. cycle

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Abstracts from the world's literature of interest to those who make or use plastics or plastics products. Send requests for periodicals to the publishers listed.

General

POLYMERIZATION PRODUCTS. J. W. C. Crawford. Reports on the Progress of Applied Chem. *33*, 338-51 (1948). Developments in polymerization processes for synthesizing plastics are discussed. These include polyethylene, polystyrene, polyvinyl chloride, fluorine-containing polymers, acrylic polymers, allyl polymers, cross-linked cellulose derivatives, and other polymers. 82 references.

POLYCONDENSATION PRODUCTS. A. A. K. Whitehouse. Reports on the Progress of Applied Chem. *33*, 352-66 (1948). Developments in polycondensation processes for synthesizing plastics are discussed. These include phenolic, furan, thiophene, urea, melamine, polyesters, polyamides, and silicone plastics. 135 references.

PLASTICS FROM NATURAL POLYMERS. T. N. Parkin. Reports on the Progress of Applied Chem. *33*, 367-76 (1948). Developments in the synthesis of plastics by modification of natural products is described. These include cellulose derivatives and proteins. 109 references.

PLASTICS SPECIFICATIONS IN THE FEDERAL GOVERNMENT. G. Reinsmith. A. S. T. M. Bull. No. 163, 78-80 (Jan. 1950). The preparation, status, and philosophy of government specifications for plastics are discussed.

TAKING STOCK 1949-1950. Brit. Plastics *22*, 2-18 (Jan. 1950). The present status and future of the plastics industry in Great Britain are reviewed by authorities in the field.

Materials

POLYETHYLENE-POLYISOBUTYLENE BLENDS. R. G. Newberg. Modern Packaging *33*, 121-4, 172 (Jan. 1950) The stability, gas permeability, water permeability, chemical resistance, and strength properties of polyethylene-polyisobutylene blends are reported. These blends serve to improve the properties of both polymers and are economically feasible. These new materials appear useful for applications in the packaging industry.

BITUMINOUS PLASTICS. D. A. Turner. Brit. Plastics *22*, 32-9 (Jan. 1950). The synthesis, formulation, properties, and applications of bituminous plastics are described.

THE SEARCH FOR NEW PLASTICIZERS. Plastics (London) *14*, 26-7, 32 (Aug. 1949). The properties desired of new plasticizers are: 1) compatibility; 2) permanent plasticizing action; 3) impartation of low temperature flexibility; 4) lack of odor; 5) nontoxicity; 6) tastelessness; and 7) nonflammability. The weaknesses of commonly used plasticizers in these respects are discussed.

PREDICTION OF SHRINKAGE IN ADDITION POLYMERIZATIONS. F. S. Nichols and R. G. Flowers. Ind. Eng. Chem. *42*, 292-5 (Feb. 1950). A method of predicting, from its structural formula, the percent shrinkage of a vinyl or allyl monomer during polymerization is described. A curve shows the relation between shrinkage and volume of revolution of the monomer molecule about its major axis. A method is given whereby this volume may be readily calculated.

WATER CONTENT OF HYDROPHILIC PHENOL - FORMALDEHYDE RESINS: VAPOR PRESSURE-TEMPERATURE RELATIONSHIPS. R. W. Bentz and H. A. Neville. J. Polymer Sci. *4*, 673-88 (Dec. 1949). The significance of the water content to the physical properties of phenol-formaldehyde resins at various stages of preparation is briefly discussed. Available methods for the determination of water in such resins were found to be either unreliable or too elaborate for process control. It was undertaken to develop a simple, rapid, relative method for the continuous measurement of water content which can be used to follow the process of dehydration and to indicate the end-point which will result in the best dispersion of water in the cured resin. In order to standardize or calibrate such a relative method, it was necessary also to develop an absolute method for the analysis of water in the resol. The composition of a homogeneous mixture of liquids is reflected by its vapor pressure-temperature relationships. During dehydration at 80° C., the vapor pressure of the resol decreases about 350 mm. of mercury. A very sharp increase in the slope of the vapor pressure curve occurs at approximately the proper degree of dehydration. At this stage a slight decrease in water content causes a very large decrease in vapor pressure. The sharp inflection in the curve is attributed to the existence of both "free" and "bound" water in the resin. During the process of vacuum dehydration of the resin, while the "free" water decreases to approximately one-eighth of its original content, the "bound" water remain substantially constant. The binding of water is attributed to the methylol groups of the resol molecules, and its release during the cure or hardening of the resin is considered to result from the conversion of these groups to methylene linkages.

KORESIN AND RELATED RESINS. C. S. Marvel, R. J. Gander, and R. R. Chambers. J. Polymer Sci. *4*, 689-702 (Dec. 1949.) The infra-red and ultra-violet absorption spectra of Koresin are very similar to those of an acid-catalyzed *p-tert*-butylphenol-acetaldehyde polymer. A variety of phenol-aldehyde resins were prepared for comparison with Koresin. The ratings of some of these materials as tackifiers are reported. These furnish further evidence that the molecular weight of a phenol-aldehyde resin is important in its tackifying action. An alkaline-catalyzed condensation product of acetylene and *p-tert*-butylphenol shows no tackifying

(*Continued on p. 154*)

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action and has no free hydroxyl in the polymer as judged by its infrared pattern.

PLASTICIZERS FOR POLYVINYL CHLORIDE. F. Kainer. Brit. Plastics *21*, 677-84 (Dec. 1949). The properties of plasticizers for polyvinyl chloride are reviewed. 61 references. English translation from Kunstoffe *38*, 163-7 (1948).

REACTIONS OF RESINS WITH DRYING OILS. P. O. Powers, Ind. Eng. Chem. *42*, 146-50 (Jan. 1950). Drying oils react with resins either by acid, alcohol, or ester interchange or by addition reactions at the double bond. The occurrence of the ester reactions is well established and is often the basis of the formation of alkyd reins. Ester-type resins combine with the drying oils by ester interchange, and while quantitative measure of the extent of this reaction cannot be readily obtained, definite indications of the reaction are obtained by marked changes in the solubility of the resin on heating with the drying oil and by changes in the viscosity. These effects are most pronounced with resins of high viscosity and low solubility. Reactive phenolic resins are known to combine with the drying oils, particularly the conjugated type, but this reaction must be regarded as secondary to the polymerization reaction, and the unreactive phenolic resins ordinarily used with drying oils give little evidence of any appreciable chemical reaction with the oil. Hydrocarbon resins, in general, do not combine with drying oils.

CROSS-LINKING OF CELLULOSE ACETATE, R. W. Moncrieff. Plastics (London) *14*, 108-10, 135-7 (Nov., Dec. 1949). The types of cross-links described are: a) ester groups of di-or poly-basic acids; b) substituted ureas; c) substituted melamines; and d) disulphide bonds similar to those found in hair fibers. The chemistry of methods (a) and (d) is much simpler and more attractive than that of (b) and (c), since the possibilities of reaction are so numerous the nature of the chemical structure of the final product is never known. Methods are described which can be applied to filaments, yarns, and

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Molding and Fabricating

SEALING OF POLYETHYLENE. W. Ryan. Modern Packaging *23*, 133-7 (Dec. 1949). Various techniques for heat sealing polyethylene film are described.

MORE ON PLASTICS DESIGN PROBLEMS. Electrical Manuf. *45*, 94-7, 176, 178, 180, 182, 184 (Feb. 1950). Problems involved in the design and production of plastic products are discussed.

DEVELOPMENTS IN PERMANENT DISPLAY MATERIAL. Plastics (London) *14*, 9 (Aug. 1949). Various designs are printed on laminated plastics by a silk screen process.

CONTINUOUS LAMINATING OF REINFORCED PLASTICS. S. M. Cash. S.P.E. J. *6*, 21-4 (Jan. 1950). A process for the continuous manufacture of reinforced plastics is described.

MACHINERY FOR PLASTIC COATING. A. Gaio. S.P.E. J. *6*, 24-7 (Jan. 1950). Various types of machines for coating fabric and paper with plastics are described.

LONG-WAVE RADIANT HEATING FOR PLASTICS. T. Walsh. S.P.E. J. *6*, 27-9 (Jan. 1950). A radiant heating process for use in the molding and fabrication techniques for plastics is described.

EXTRUSION NEEDS. M. S. Greenhalgh. S. P. E. J. *6*, 29-31 (Jan.

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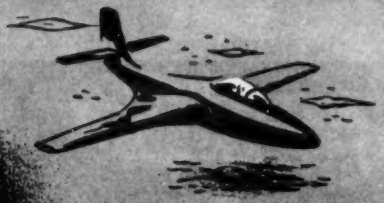

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1950). Needed improvements in extrusion equipment are described by a molder.

Applications

DESIGN THE RIGHT PLASTIC INTO YOUR MAJOR APPLIANCE. F. A. Martin. Electrical Manuf. *45*, 60-5, 154, 156, 158, 160, 162, 164 (Jan. 1950). The properties of plastics are reviewed from the viewpoint of applications in household appliances. Selection factors and test results are discussed.

EFFECT OF CHLORINE ON CATION EXCHANGE RESINS. D. G. Braithwaite, J. S. D'Amico, and M. T. Thompson. Ind. Eng. Chem. *42*, 312-15 (Feb. 1950). The effects of chlorine water at different concentrations and pH's on several cation exchangers in various salt form were determined by measuring free chlorine consumed to the point of breakdown as evidenced by increased color throw. Sulfonated coal and sulfonated phenol-formaldehyde exchangers showed various resistance to oxidation by chlorine, but all eventually disintegrated. Sulfonated pure hydrocarbon resins proved stable toward the action of chlorine. A theory of the mechanism of chlorine attack on sulfonated phenol-formaldehyde resins is presented which explains the capacity titration curves obtained before and after chlorine attack.

Testing

SOME NOTES ON THE EFFECT OF TESTING MACHINES ON THE TENSILE PROPERTIES OF PLASTIC FILMS. L. Boor. A. S. T. M. Bull. No. 162, 46-53 (Dec. 1949). The results of tensile and elongation measurements with one rubber and three plastic films on various types of testing machines are discussed. Only those machines which give the true stress-strain relationships from zero load to failure are satisfactory to evaluate the properties of the materials.

MODERN MICROSCOPY OF FILMS AND FIBERS. F. F. Morehead. A. S. T. M. Bull. No. 163, 54-7 (Jan. 1950). Plastic films and fibers are examined by modern microscopic techniques.

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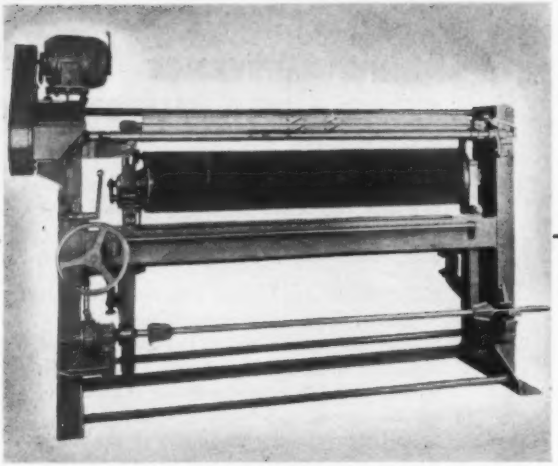

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OF FIBERS. S. B. Newman. A. S. T. M. Bull. No. 163, 57-60 (Jan. 1950). Fibers are embedded in polybutyl methacrylate for cutting very thin sections.

IDENTIFICATION OF DICARBOXYLIC ACIDS IN POLYMERIC ESTERS. R. W. Stafford, R. J. Francel, and J. F. Shay. Anal. Chem. *21*, 1454-7 (Dec. 1949). By refluxing polymeric esters with benzylamine in the presence of a catalyst, characteristic derivatives of the constitutent dicarboxylic acids can be obtained. The resulting dibenzyl amides can be separated into saturated and unsaturated fractions by the use of selective solvents. Individual dibenzyl amides can be identified in admixture by comparison of their infra-red spectra with those of a standard set of dibenzyl amides prepared from monomeric esters.

DETERMINATION OF DIBASIC ACIDS IN ALKYD RESINS. M. H. Swann. Anal. Chem. *21*, 1448-53 (Dec. 1949). No specific methods of quantitatively determining individual acids in a mixture of dibasic acids in alkyd resins have been previously reported. New methods of analysis, accurate to 0.2% and specific for phthalic, fumaric, maleic, and sebacic acids in alkyd resins, are now available. Under certain conditions, succinic and adipic acids can also be determined by newly developed procedures. A new technique for accurately determining the nonvolatile content of resins, needed for calculating the dibasic acid content, is described.

HOT PENETRATION TEST FOR POLYVINYL CHLORIDE COMPOSITIONS. J. W. Clarke. Brit. Plastics *21*, 656-7 (Dec. 1949). A hot penetration method for testing polyvinyl chloride plastic for electrical insulation is described. The test is designed to simulate conditions where a wire or cable insulated with polyvinyl chloride passes over a barrier and is subjected to some tension.

Chemistry

INFLUENCE OF ACTIVATED CARBON ON STYRENE POLYMERIZATION. J. W. Breitenbach and H. Preussler. J. Polymer Sci. *4*, 751-4 (Dec. 1949). During a definite polymerization

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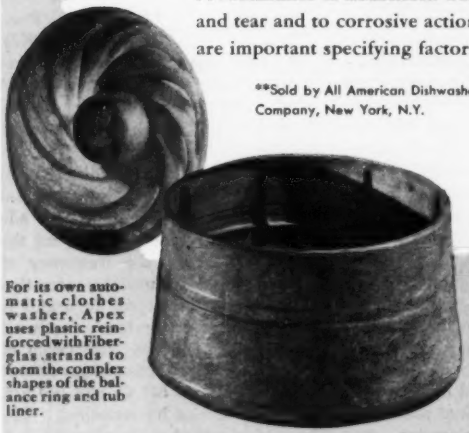

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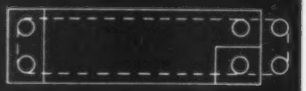

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time the rate of uncatalyzed polymerization of styrene may be decreased by the use of activated carbon. The intrinsic viscosities of the polymers may be either increased or decreased by the addition of active carbon, depending upon the activity of the carbon sample used.

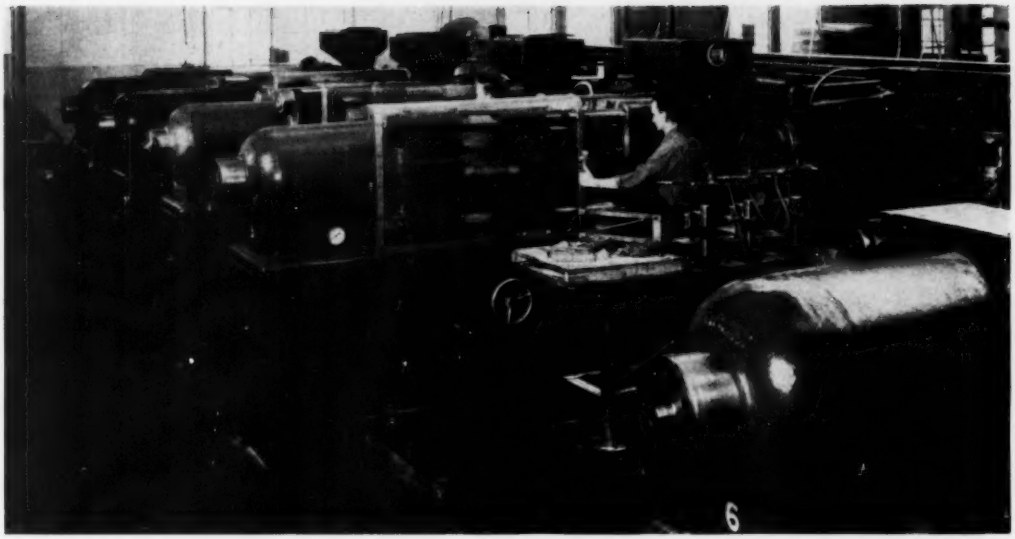
CHAIN INITIATION IN STYRENE POLYMERIZATION. W. V. Smith. J. Am. Chem. Soc. *71*, 4077-82 (Dec. 1949). The rate of persulfate combination from radio-activity measurements, the initial rate of polymer particle formation from polymer particle size measurements, and the rate of molecule formation from molecular weight measurements were obtained for styrene emulsion polymerization, and all three quantities agree within an order of magnitude. This indicates that all three are determined principally by the rate of formation of free radicals. The rate of free radical formation does not appear to depend on the interfacial area between organic and aqueous phases.

Properties

THERMAL STABILITY OF POLYESTER-STYRENE RESIN SYSTEMS. E. S. Ebers, W. F. Brucksch, P. M. Elliott, R. S. Holdsworth, and H. W. Robinson. Ind. Eng. Chem. *42*, 114-19 (Jan. 1950). A comparison is made of the influence of heat on a number of physical properties of polyester-styrene laminates and laminates of some commercial condensation-type resins. A number of chemical modifications of the polyester-styrene resins were examined, and the correlation of structure with thermal behavior is discussed. The heat resistance of polyester-styrene glass cloth laminates, as measured by the rate of loss of flexural strength and hardness during aging at 260° C., is significantly poorer than that of similar melamine-formaldehyde, phenol-formaldehyde, or silicone laminates. Changes in the chemical structure of the polyester through variation of type of glycol, type and proportion of saturated and unsaturated acids, ratio of alkyd unsaturation to monomer unsaturation, etc., had relatively little effect on the thermal stability of the system, except that certain structures, which were in themselves less stable, hurt the heat resistance of the system. The thermal degradation is mainly the result of an oxidative process. The absolute flexural strength of polyester-styrene laminates is influenced by chemical structure with increased polarity in the resin producing increased flexural strength in the laminate.

ULTRAVIOLET ABSORPTION SPECTRA OF SOME COPOLYMERS CONTAINING ACENAPHTHYLENE, AND OF RELATED COMPOUNDS. E. F. G. Herington and J. I. Jones. J. Polymer Sci. *4*, 725-33 (Dec. 1949). The strong ultra-violet absorption in the wavelength region 280-330 mμ shown by copolymers of acenaphthylene with styrene or methyl methacrylate is due to acenaphthylene residues. The spectra of samples of copolymer containing a small percentage of acenaphthylene are different from the spectrum of polyacenaphthylene. As a result of the comparison of the spectra of these copolymers with the spectra of acenaphthene and with the two forms of 1,1'-biacenaphthyl it is concluded that spectra of the copolymers can be explained as arising from the presence of pairs of acenaphthylene groups. Finally it is shown that the spectra can be used to estimate the acenaphthylene contents of the copolymers.

METHOD OF MEASURING SOME DYNAMIC ELASTIC CONSTANTS AND ITS APPLICATION TO THE STUDY OF HIGH POLYMERS. K. W. Hillier. Proc. Phys. Soc. *62*, 701-13 (Nov. 1949). The preliminary work on the measurement of velocity of propagation and attenuation of longitudinal sound oscillations in high polymer filaments already described by Hillier and Kolsky was continued. It was concluded in that paper that temperature control would be advantageous, and that by varying the temperature and the frequency of oscillations, more useful information could be acquired. An apparatus is described whereby the velocity of propagation and the attenuation of longitudinal oscillations throughout the range 0° to 50° C. and 500 c/s. to 30 kc/s. can be measured. The results obtained with one material, polythene, are discussed in terms of several theories of elasticity of high polymers, and the constants of the several equations considered are calculated from the data.



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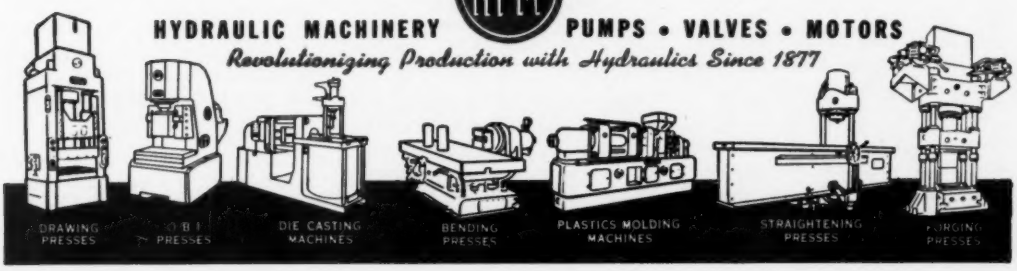


U. S. PLASTICS PATENTS

Copies of these patents are available from the U.S. Patent Office, Washington, D.C., at 25¢ each.

POLYVINYL ACETALS. C. W. Gayler (to American Viscose). U. S. 2,487,864, Nov. 15. A linear polyvinyl acetal prepared by condensing polyvinyl alcohol with an aldehyde in suspension in a non-polar medium.

POLYMERS. W. O. Kenyon and T. F. Murray, Jr. (to Eastman). U. S. 2,487,879, Nov. 15. Copolymer of a dialkenyl acetal and an unsaturated ester.

COPOLYMERS. J. E. Magoffin and H. J. Magemeyer, Jr. (to Eastman). U. S. 2,487,885, Nov. 15. Copolymer obtained by peroxide polymerization of beta-propionolactone and a vinyl compound.

TERPENE RESINS. A. L. Rummelsburg (to Hercules). U. S. 2,487,898, Nov. 15. Copolymerizing cyclic terpenes with a butadiene derivative in the presence of a Friedel-Crafts catalyst.

EXTRUSION. C. C. Waddell, H. H. Vickers, and W. W. Waterman (to Standard Oil Development). U. S. 2,487,910, Nov. 15. Extrusion apparatus for plastic material.

FLAME-RESISTANCE. R. A. Pingree and R. C. Ackerman (to Sun Chemical). U. S. 2,488,034, Nov. 15. Heating guanyl urea phosphate with formaldehyde, impregnating a textile fabric therewith in the presence of a melamine-formaldehyde resin and stearoyl oxymethyl pyridinium chloride, and heat curing.

ALGINATES. E. G. Millatt (to Alginate Industries). U. S. 2,488,135, Nov. 15. Molding a water-insoluble metal alginate mixed with an ammonium yielding compound.

EXTRUSION. A. W. Hanson (to Dow). U. S. 2,488,189, Nov. 15. A machine for mixing, milling, and extruding plastic materials.

SEALING. J. H. Lloyd, Jr. (to Visking). U. S. 2,488,212, Nov. 15. Flame-sealing the end of a plastic tube to provide a container.

MOLDING COMPOSITION. W. P. Roush. U. S. 2,488,332, Nov. 15. Heating phenol and hexamethylenetetramine to form a resin, adding metal particles, adding formaldehyde, hexamethylenetetramine, and aluminum stearate to form a molding compound.

ADHESIVES. F. J. Nagel (to Westinghouse). U. S. 2,488,428, Nov. 15. Process for producing a polyhydroxy-benzene-formaldehyde adhesive.

CASTING. J. Swiss (to Westinghouse). U. S. 2,488,446, Nov. 15. Mold for casting polytetrafluoroethylene.

CONDENSATES. C. E. Trautman (to Gulf Research and Development). U. S. 2,488,449, Nov. 15. An organosilicon-phosphorus condensate.

RESORCINOL-FORMALDEHYDE. A Malashevitz (to Catalin). U. S. 2,488,495, Nov. 15. Dissolving resorcinol, and formalin in methanol, and reacting with controlled pH.

POLYSTYRENE. H. F. Park, C. H. Basdekis, and R. I. Dunlap, Jr. (to Monsanto). U. S. 2,488,502-3, Nov. 15. Emulsion polymerization of styrene.

FILM. R. R. Trull (to Dow). U. S. 2,488,571, Nov. 22. Method for producing polyvinylidene chloride film.

CELLULOSE ETHERS. W. B. Kunz (to American Viscose). U. S. 2,488,631, Nov. 22. Process for manufacture of hydrophilic cellulose ethers.

VINYL RESIN. L. R. Whiting and M. V. Goodyear (to Bakelite). U. S. 2,488,651, Nov. 22. A water-insoluble vinyl resin, containing hydroxyl groups, reacted with chromium trioxide and phosphoric acid.

POLYMERIZATION. W. N. Stoops (to Carbide). U. S. 2,488,690, Nov. 22. Diazoaminobenzene phenolic compound catalyst combinations in butadiene-styrene emulsion polymerization.

MOLDING. A. S. Watkins (to Produx). U. S. 2,488,786, Nov. 22. Injection molding apparatus.

BRUSHES. E. H. Haux (to Pittsburgh Plate Glass). U. S. 2,488,865, Nov. 22. Method of making synthetic bristle of cellulose triacetate.

POLYMERS. E. C. Shokal and P. A. Devlin (to Shell Development) U. S. 2,488,883, Nov. 22. Polymers of the condensate of formaldehyde with unsaturated esters of ketocarboxylic acids.

CELLULOSE ACETATE. H. Fox and J. W. Kneisley (to Hercules). U. S. 2,489,128 and 2,489,142-3, Nov. 22. Fractionation process for production of optically clear cellulose acetate.

SYNTHETIC RESIN. D. J. Lieb, L. E. Clark, Jr., and R. J. Spahr (to Borden). U. S. 2,489,145, Nov. 22. A hardenable urea-aldehyde condensate combined with an organoboron trihalide complex.

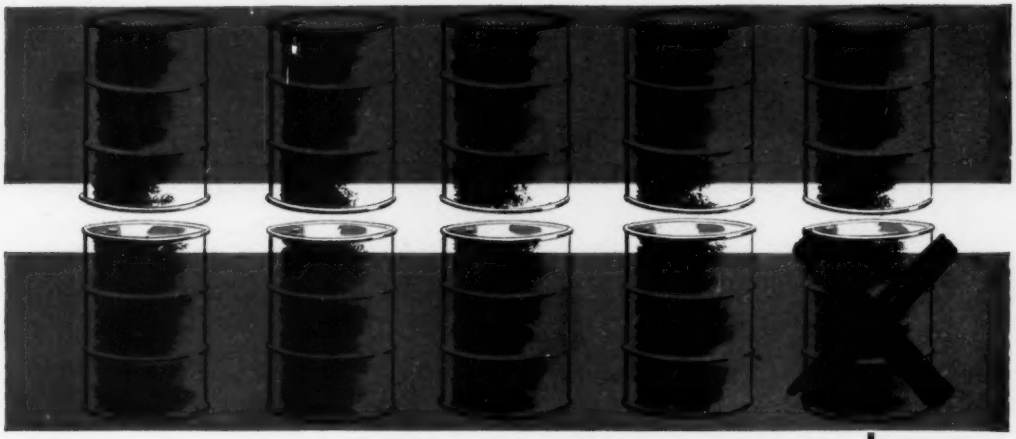
ADHESIVE. L. C. Wooster and E. E. Gardiner (to Stancal Asphalt and Bitumuls). U. S. 2,489,170, Nov. 22. An adhesive comprising asphalt, synthetic resin, a water-soluble glue, and an alkali metal silicate.

CONDENSATES. I. Hechernbleikner (to American Cyanamid). U. S. 2,489,181, Nov. 22. Condensate of acrylonitrile and dicyandiamide.

CELLULOSE ETHERS. E. K. Morris (to Dow). U. S. 2,489,225, Nov. 22. Treating a thermoplastic ether or ester of cellulose with phosphorus trichloride, treating with an amine, removing water-soluble by-products, and drying.

POLYSTYRENE. E. D. Morris and S. S. Drake (to Dow). U. S. 2,489,226, Nov. 22. Method of making pigmented polystyrene.

CONDENSATES. R. J. Spahr, W. R. Moffitt, and E. H. Pryde (to Borden). U. S. 2,489,336, Nov. 29. A water-soluble phenolic glue prepared by reacting a phenol with formaldehyde,



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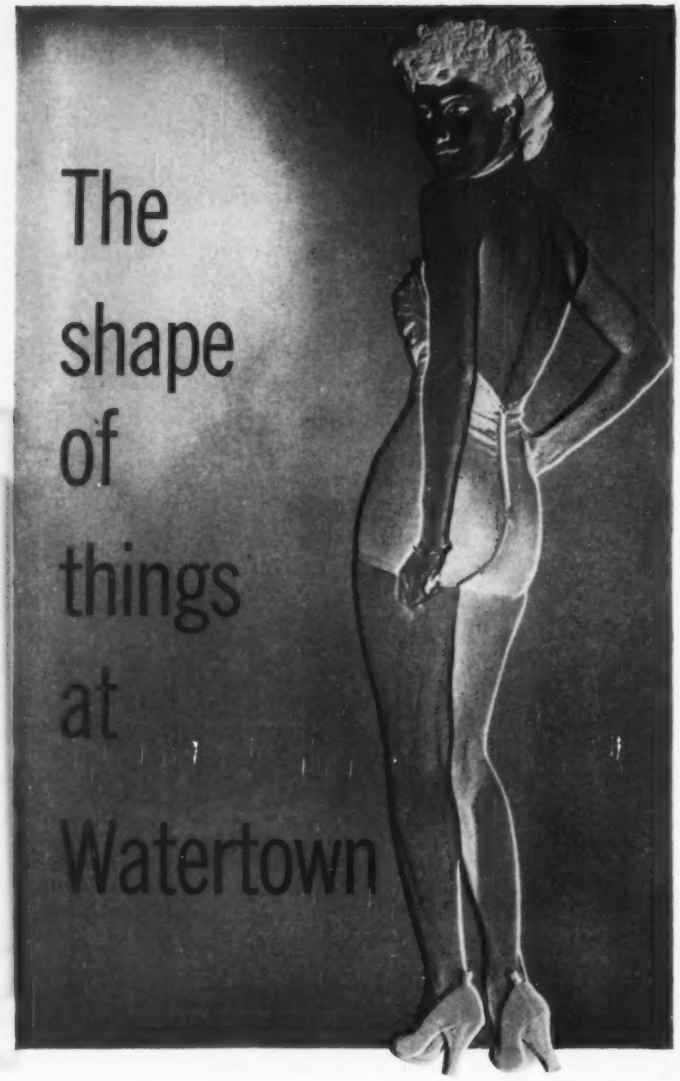

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CONDENSATES. H. A. Bruson and W. D Niederhauser (to Rohm & Haas). U. S. 2,489,366, Nov. 29. Resinous materials prepared by condensing an aldehydo non-aromatic carboxylic acid and a polyamine.

CELLULOSE ESTERS. M. E. Martin and T. M. Andrews (to Celanese). U. S. 2,489,382, Nov. 29. Cellulose propionate prepared by esterification with propionic acid, propionic anhydride, and catalyst until clear solution is formed and precipitating.

VINYL CHLORIDE RESINS. S. L. Burt (to Bakelite). U. S. 2,489,518, Nov. 29. Composition containing vinyl chloride resin and a heat stabilizer comprising a dialkyl tin dialcoholate of a monohydroxyl compound.

MOLDING. H. E. Read (to Continental Can). U. S. 2,489,541, Nov. 29. Molding material comprising a fibrous sheet having slits and stretched to have a flexible open mesh and secured to unbroken surface sheets impregnated with moldable resin.

PLASTICIZERS. E. P. Rittershausen (to Socony-Vacuum Oil). U. S. 2,489,674, Nov. 29. A vinyl resin plasticized with a thiophene polymer.

POLYESTERS. D. W. Jayne, Jr. and H. M. Day (to American Cyanamid). U. S. 2,489,711, Nov. 29. Heating an omega-hydroxy saturated aliphatic carboxylic acid with a glycol acid ester of an alpha, beta unsaturated dicarboxylic and curing in the presence of a peroxy catalyst.

MOLDING MATERIAL. I. W. Cox (to Cutler-Hammer). U. S. 2,489,753, Nov. 29. Device for heating in combination a mixture of thermoplastic and thermosetting resins.

EXTRUSION. C. K. Bump (to Monsanto). U. S. 2,489,951, Nov. 29. Device for extruding polyvinyl acetal resin sheets comprising an orifice-defining structure.

COPOLYMER. D. T. Mowry and C. L. Mills, Jr. (to Monsanto). U. S.

(*Continued on p. 169*)

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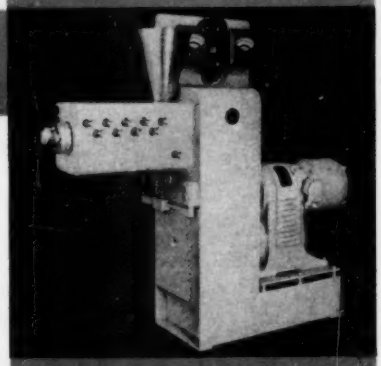
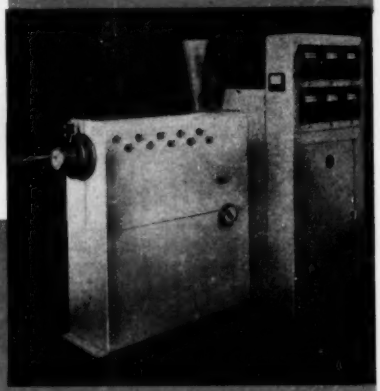
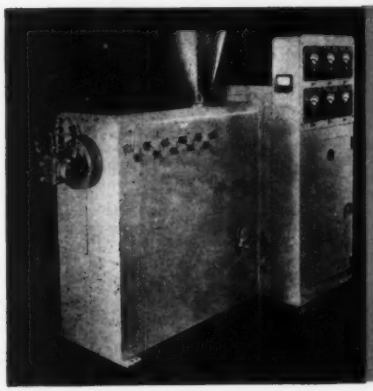


MPM 1½" Extruder This machine has been installed in scores of leading material suppliers' laboratories and in customers' plants. It handles a wide range of applications such as wire coating, blown film, rods, tubes, stripe and the like. Materials extruded include Nylon, Kel-F, polystyrene, acetate, methacrylate, polyethylene, polyvinyl chloride and Formvar.



MPM 2½" Extruder The 2½" unit will extrude up to 125 pounds of polyvinyl chloride melting hourly, for example, and up to double the capacity of other machines with methacrylate. It can be furnished with a broad range of interchangeable heads and, like all other MPM extruders, it will extrude an extremely wide selection of materials.



MPM 3½" Extruder An extremely high - production machine, the new MPM 3½" Extruder excels in covering wire, compounding and coloring resins, and in producing heavy cross sections and wide films. As much as 150 to 250 pounds per hour can be produced, depending on the materials and the application.

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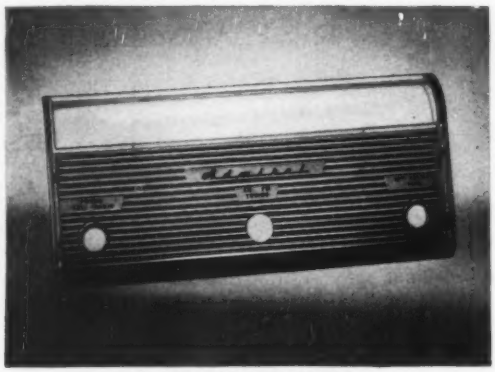

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(*Continued from p. 166*)

2,489,972, Nov. 29. Copolymer of a vinyl aromatic compound and an alkylidine phthalide.

IMPREGNATION. F. Y. Speight, Jr. (to American Cyanamid). U. S. 2,489,985, Nov. 29. A spiral roll of fibrous material impregnated with copolymerizable alkyd resin-styrene mixture.

RUBBERLIKE POLYMERS. D. W. Jayne, H. M. Day, and E. L. Kropa (to American Cyanamid). U. S. 2,490,001-2-3-4-5, Nov. 29. Rubberlike products obtained by heating a monoalkylolamine with a saturated aliphatic hydrocarbon dicarboxylic acid, reacting the product with a glycol acid ester of an alpha, beta-unsaturated aliphatic dicarboxylic acid, and curing in the presence of a peroxy catalyst.

THERMOPLASTIC. W. P. Moeller and J. H. Prichard (to Celanese). U. S. 2,490,148, Dec. 6. Thermoplastic composition having high impact strength comprising ethyl cellulose plasticized with mineral oil and partially hydrogenated terphenyls.

MOLD. I. T. Quarnstrom. U. S. 2,490,229, Dec. 6. Mold for injection molding of plastic material.

FLOOR TILE. L. O. Amberg (to Hercules). U. S. 2,490,247, Dec. 6. Akali-resistant floor tile comprising polyvinyl chloride and polyvinyl chloride acetate, a plasticizer comprising a rosin acid nitrile and dehydrorosin acid nitrile, and filler.

RESINS. G. C. Johnson (to Socony-Vacuum Oil). U. S. 2,490,270, Dec. 6. Reacting thiophene and turpentine in the presence of a Friedel-Crafts catalyst.

SILOXANES. J. F. Hyde (to Corning Glass). U. S. 2,490,357, Dec. 6. Contacting cyclic diorganosiloxanes with alkali metal hydroxide and heating until polymerization occurs.

ISOPROPENYL TOLUENE. A. S. Nyquist and E. L. Kropa (to American Cyanamid). U. S. 2,490,372, Dec. 6. Polymerizing isopropenyl toluene at 110° C. or lower in the presence of a seed obtained by treating isopropenyl toluene with a catalyst such as boron fluoride.

COPOLYMERS. E. J. Tauch (to Du Pont). U. S. 2,490,489, Dec. 6.

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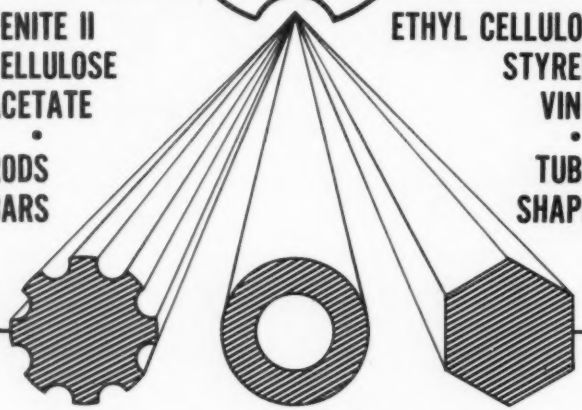

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CELLULOSE ESTERS. C. J. Malm (to Eastman). U. S. 2,490,643, Dec. 6. Continuous method for producing cellulose esters having high propionyl and butyryl content.

COATING COMPOSITIONS. G. D. Hiatt (to Eastman). U. S. 2,490,752, Dec. 6. Strippable coating consisting of cellulose acetate butyrate, mineral oil, chlorinated diphenyl, and an abietate.

RESINS. T. T. M. Laakso and W. O. Kenyon (to Eastman). U. S. 2,490,757, Dec. 6. Alpha carbamoxy acrylic ester polymers.

RESORCINOL-FORMALDEHYDE. R. J. Spahr and D. J. Lieb (to Borden). U. S. 2,490,927, Dec. 13. Reacting resorcinol and formaldehyde in the presence of a water-soluble polyhydroxyalkane at a pH between 6.2 and 7.5.

SHEET MATERIALS. S. C. Frowde (to I. C. I.). U. S. 2,491,102, Dec. 13. Flexible shaped articles comprising gelatinized polyvinyl chloride and a resinous interpolymer of a methacrylic ester and a methacrylamide.

DENTURES. E. H. Zahn (to Austenal Laboratories). U. S. 2,491,146-7, Dec. 13. Patterns and molds for forming dentures.

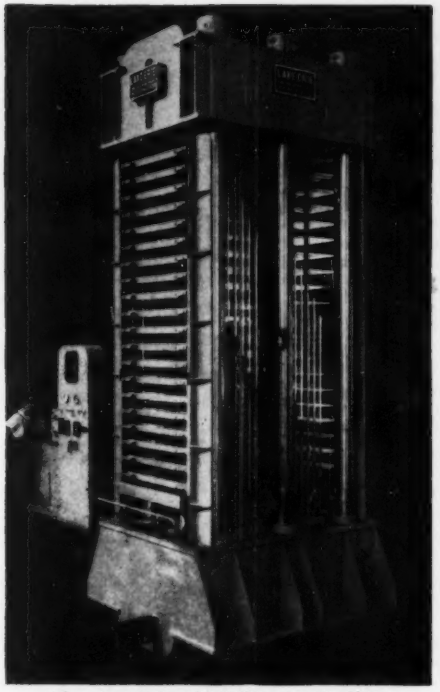
MOLDING. E. I. Valyi (to A. R. D. Corp.) U. S. 2,491,343, Dec. 13. An injection molding machine.

COPOLYMER. E. L. Kropa and A. S. Nyquist (to American Cyanamid). U. S. 2,491,409, Dec. 13. Copolymer of unsaturated fumarate alkyd resin.

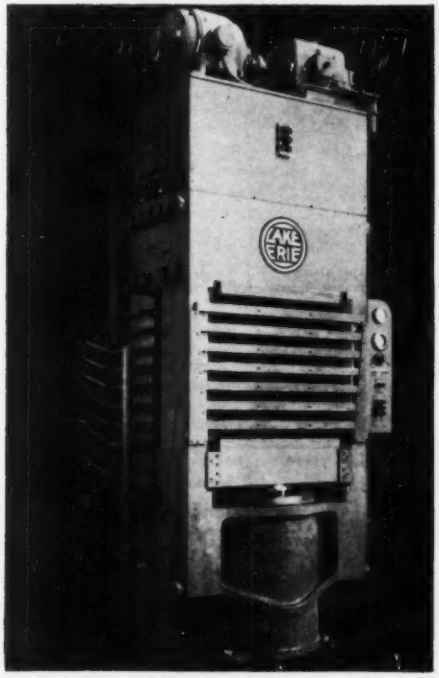
INTERPOLYMERS. W. D. Wolfe (to Wingfoot). U. S. 2,491,433, Dec. 13. Interpolymers of butadiene, acrylonitrile, and a hexadiene.

COLOR STABILIZER. F. W. Cox and J. Wallace, Jr. (to Wingfoot). U. S. 2,491,443-4, Dec. 13. A polymer of polyvinyl halide, a monoolefinic polymerizable compound, and ammonium or urea nitrate or sodium nitrate.

POLYVINYL FORMAL. W. R. Richard (to Monsanto). U. S. 2,491,455,



Column type design with 1950-ton capacity. Platens measure 54" x 102".



Rigid side plate design with 1000-ton capacity. Platens measure 42" x 36".

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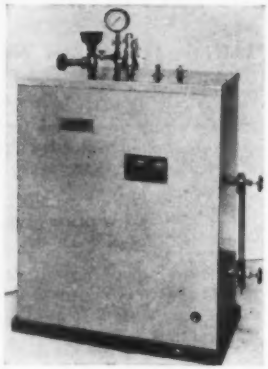

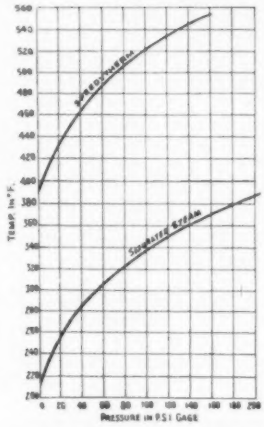

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Dec. 13. Polyvinyl formal resin plasticized with a dialkoxyethyl ester of a phthalic acid or a dialkyl ester thereof.

COPOLYMERS. H. W. Arnold (to Du Pont). U. S. 2,491,471, Dec. 20. Copolymers of acrylonitrile and vinylpyridine.

POLYMERS. J. Harmon (to Du Pont). U. S. 2,491,472, Dec. 20. Polymerizing in aqueous solution a salt of vinyl pyridine with an acid.

COPOLYMERS. W. J. Sparks and D. W. Young (to Standard Oil). U. S. 2,491,525-6, Dec. 20. A thin self-supporting film of isobutylene-styrene copolymer containing zinc stearate or zinc dilinoleate.

POLYVINYL ALCOHOL. G. W. Brant (to Du Pont). U. S. 2,491,642, Dec. 20. Solution of polyvinyl alcohol, water, and as a stripping agent, a polyethylene oxide.

CELLULAR OBJECTS. A. S. Biggs and G. E. Scharff (to I. C. I.). U. S. 2,491,709, Dec. 20. Preparation of cellular rubber or plastic compositions by means of dinitrosoamino compounds.

ALKYD RESINS. P. W. Ham (to G. E.). U. S. 2,491,811, Dec. 20. A coating of the reaction product of tetrachlorophthalic anhydride, coconut oil fatty acids, and glycerol, and ethyl cellulose.

RESIN. P. Caccia (one-fourth to M. DiGirolamo). U. S. 2,491,851, Dec. 20. Reacting unsaturated fatty oil, sulfur, and quinoline or pyridine by heating to 180° C. until exothermic action occurs and allowing to proceed.

POLYVINYL CHLORIDE. C. C. Johnson (to Du Pont). U. S. 2,491,923, Dec. 20. Bookbinding material prepared by coating fabric on one side with a composition of polyvinyl chloride, propylene glycol sebacate, and solvent and applying a surface coating of polyvinyl chloride, silica gel, and solvent.

COPOLYMERS. M. Baer (to Monsanto). U. S. 2,492,086-7-8-9, Dec. 20. Preparation of granular polymers of vinyl chloride with diethyl maleate and vinyl acetate.

SILOXANES. M. M. Sprung (to G. E.). U. S. 2,492,129, Dec. 20. Method of preparing solid elastic methylpolysiloxanes.

ELASTOMERS. W. C. Mast, L. T. Smith and C. H. Fisher (to U. S.). U. S. 2,492,169-70, Dec. 27. Copolymers of an alkyl acrylate with a polyolefinic ether or a haloalkyl acrylate.

VINYL CHLORIDE COPOLYMERS. C. W. Gayler (to American Viscose). U. S. 2,492,419, Dec. 27. Copolymers of vinyl chloride and acrylonitrile plasticized with a phenol such as thymol or orcinol or a monohydric alcohol having 5 to 9 carbon atoms.

CELLULOSE ESTERS. G. A. Richter, Jr. (to American Viscose). U. S. 2,492,442, Dec. 27. Reacting cellulose simultaneously with adipyldichloride and lauroyl chloride in the presence of pyridine and toluene.

CELLULOSE ESTERS. G. A. Richter, Jr. (to American Viscose). U. S. 2,492,443, Dec. 27. Reacting cellulose with a monobasic organic acid and a polybasic acid in the presence of a halogen-substituted monobasic organic acid and a catalyst.

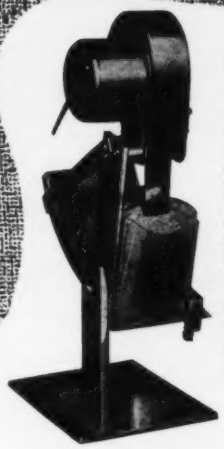
CELLULOSE ETHERS. R. B. Darling (to Hercules). U. S. 2,492,524, Dec. 27. Mixing cellulose, ethyl chloride, and alkali in a closed vessel with a predetermined amount of air.

RESINS. H. L. Allen and E. G. Kerr (to Allied Chemical). U. S. 2,492,-677, Dec. 27. Heat polymerizing in the presence of alkali metal or ammonium hydroxide a tar acid, formaldehyde, and a predominately aromatic hydrocarbon oil.

RESINS. A. L. Fox, H. L. Sanders, and R. T. Olsen (to General Aniline). U. S. 2,492,855, Dec. 27. Reacting formaldehyde with a primary or secondary arylamine and reacting this product with dicyandiamide to form a polyarylbiguanide resin and further reacting this with formaldehyde.

CELLULOSE DERIVATIVE. D. S. Breslow (to Hercules). U. S. 2,492,928, Dec. 27. Cellulose ester of rosin carbamic acid.

POLYMERIZATION. W. R. Cornthwaite (to Du Pont). U. S. 2,492,929, Dec. 27. Polymerizing a vinyl ester of a carboxylic acid in non-aqueous medium such as dioxane, tetrahydrofuran, or tetrahydropyran in the presence of a peroxy catalyst.



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BOOKS AND BOOKLETS

Write for these publications to the companies listed. Unless otherwise specified, they will be sent gratis to executives who request them on business stationery.

A Chemistry of Plastics and High Polymers, by P. D. Ritchie.

Published by Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y. Price $4.50. 286 pages.

Aimed primarily at organic chemists, this book is said to be first in its field to treat polymer chemistry from an organic point of view, emphasizing the synthetic and structural aspects rather than the physical chemistry.

Dealing with natural and synthetic, usual and unusual, and inorganic as well as organic polymers, the book contains a summary of raw material sources and current synthetic methods and a survey of recent advances. Numerous graphic formulae illustrate the text.

Annotated Comprehensive List of Trade Names of Synthetics, by T. R. Dawson and M. J. Thomsett.

Published as Information Bureau Circular No. 372 by the Research Assn. of British Rubber Manufacturers, 108 Lansdowne Rd., Croydon, England. Oct. 1949. Price $10.00. 230 pages.

This alphabetical list of some 7864 entries covers the trade and generic names used in the rubber and plastics industries. It was compiled from books and magazines published during the period June 30, 1926, to at least July 31, 1949. Where the information was available, it gives the name, nature or chemical composition, form in which the synthetic is available, manufacturer or supplier, and the town where he is situated. It is international in scope and is undoubtedly the most comprehensive list of its type ever published. Any laboratory or office plagued with the trade-name problem will want this circular.

Fundamentals of Synthetic Polymer Technology, by R. Houwink.

Published by Elsevier Publishing Co., 215 Fourth Ave., New York, N. Y. Price $4.75. 258 pages.

Supplementing material already discussed in many books, this latest addition, a completely revised edition of "Technology of Synthetic Polymers" (1947) by the same author, is essentially different in approach in that it touches the fundamental background of the chemical and physical factors in the preparation and use of synthetic polymers. In addition, it contains suggested solutions to many of the problems which arise in manufacture. There is a discussion of the properties and structural formulas of all the chief groups of industrial plastics. The researches and results of both European and American technologists are said to be coordinated here for the first time.

Vinylite, vinyl butyral resins—The use of vinyl butyral resins in the formulation of coatings is set forth in this 22-page booklet. Under discussion are the general properties of the material, its compatibility and solubility, and its many applications. Of particular interest is the development of the "wash primer" type of metal conditioner, which protects metal from corrosion between the time of surface preparation and the application of subsequent coatings. Included is a comprehensive chart of the compatibility of different vinyl butyral resins. *Bakelite Div., Union Carbide and Carbon Corp., 300 Madison Ave., New York 17, N. Y.*

Rotary feed table—Bulletin T-25—Detailed information on the company's line of mechanically operated and electrically operated models is contained in this 8-page bulletin. The feed table is used for faster feeding of work pieces to machine tools. *The Bellows Co., 222 W. Market St., Akron, Ohio.*

Plexiglas for modern store fronts—This 24-page booklet illustrates numerous applications of acrylic plastic Plexiglas for external use on supermarkets, automobile accessories, bakeries, department stores, and specialty shops. Distinctive treatments to be gained with clear or translucent material in flat or corrugated forms are also discussed. The final section shows 30 structural installation details and a dozen methods of mounting letters on plain and corrugated backgrounds. *Rohm & Haas Co., Washington Square, Philadelphia, Pa.*

Koroseal greenhouse hose—This catalog section describes the construction and operation of the hose. Advantages claimed for the material include: flexibility; ability to spread water faster; open end service; durable ribbed surface; and secure Punch-Tok couplings. Specifications are also listed. *The B. F. Goodrich Co., Akron, Ohio.*

Laminated plastics for the textile industry—This illustrated, 4-page folder shows how the strength, lightness, and chemical and moisture resistance of laminated plastics have led to widespread use in the textile industry. Products described include headless package tubes, precision bobbins and pirns, hosiery turning and examining forms, furnisher and other rolls, redraw caps, dye sticks, and sizing bobbins and caps for the nylon industry. *Synthane Corp., Oaks, Pa.*

Hydrogen peroxide—Hydrogen peroxide solutions of 27.5, 35, and 50% concentration are described in this booklet, which contains a compilation of physical data and properties of hydrogen peroxide, lists a large number of its reactions in organic and inorganic chemistry, and enumerates its applications and uses. Information on engineering materials, shipping containers, analytical methods, and physiological properties is also included. *Buffalo Electro-Chemical Co., Inc., Station B, Buffalo 7, N. Y.*

Polyvinyl acetate solutions—Technical Bulletin P-15—A review of the forms, properties and uses of polyvinyl acetate manufactured by the solution polymerization of vinyl acetate at high concentration in a variety of solvents is contained in this booklet. One section deals with the uses of these solutions as adhesives, paper coatings, saturants,

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Color	White
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Acidity (as Phthalic Acid), %	0.01 Maximum
Ester content, % by weight	99 Minimum
Melting Point, °C	62-65
Containers	Fibre drums containing approximately 250 pounds net.

BARRETT "ELASTEX" 10-P PLASTICIZER
(Diisooctyl Phthalate)

Color	50 Hazen, Maximum
Form	Clear liquid
Odor	Mild, characteristic
Acidity (as Phthalic Acid), %	0.01 Maximum
Specific Gravity, 20/20°C	0.983 to 0.987
Saponification Number	280-290
Cloud test	Clear at 0°C
Containers	50-55 gal. non-returnable steel drums.

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Color	80 Hazen, Maximum
Form	Clear liquid
Odor	Mild, characteristic
Distillation at 5 mm. Hg, (5-95%) °C	189-222
Specific Gravity, 20/20°C	1.075 to 1.081
Acidity (as Phthalic Acid), %	0.01 Maximum
Saponification Number	364-374
Containers	50-55 gal. non-returnable steel drums.

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Form	Clear liquid
Odor	Mild, characteristic
Acidity (as Phthalic Acid), %	0.01 Maximum
Specific Gravity, 20/20°C	0.983 to 0.989
Ester Content, % by weight	99 Minimum
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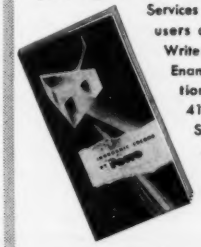

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A pictorial travelogue through West Coast Univ.—The University's program in the education and training of engineers and technicians for industry is set forth in this 24-page booklet. The instruments, machines

new chemicals which have become available from the company's research laboratories during the last year, and on which separate bulletins have been issued, have been compiled in a book titled "Collective Volume I." Some of the chemicals covered are arylbiguanides, guanylurea salts, beta chloropropionitrile, lactonitrile, succinonitrile, and potassium cyanate. *New Products Development Dept., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.*

Vickers oil hydraulic pumps and controls—The company's line of equipment which is extensively used on industrial machinery, is described in this 48-page booklet. Specific units covered are pumps; pressure; volume, and directional controls;

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sizing, inks, lacquers, protective coatings and hot melts. A list is included of recommended solvents, diluents, modifiers, plasticizers, and other addends. *American Polymer Corp., 101 Foster St., Peabody, Mass.*

Plastics merchandisers—"Adventures in Good Living with Housewares of Monsanto Plastics" is the first of a series to be published this year. The bulk of this 28-page booklet is a pictorial parade of new houseware items made with the company's plastics. Also included is a Plastic Housewares Directory, listing merchandisers of these products. *Monsanto Chemical Co., Plastics Div., Springfield, Mass.*

Tips on trade with Marshall Plan countries.—This 46-page brochure, which has been checked by ECA officials and ERP-country officials, explains how to go about getting orders financed with ECA funds, discusses the future of ECA-financed business, and lists ECA assistance available to small business.

A large section of the booklet is devoted to descriptions of procedures used by ECA countries in making purchases, and the products they are likely to buy. An appendix briefly summarizes what the Marshall Plan has accomplished, the basic features of the plan, how ERP countries determine their needs, the role of ECA in issuing procurement authorizations, and payment to U. S. businessmen, with added information on prices, discounts, and commissions. *National Association of Manufacturers, New York, N. Y.*

Tenite extrusion—Completely revised, this third edition gives up-to-date information on equipment and choice and handling of material for successful continuous extrusion of Tenite I, Eastman cellulose acetate, and Tenite II, Eastman cellulose acetate butyrate. Special sections of this 28-page booklet deal with the extrusion of Tenite tubing and sheeting. *Tennessee Eastman Corp., Kingsport, Tenn.*

A pictorial travelogue through West Coast Univ.—The University's program in the education and training of engineers and technicians for industry is set forth in this 24-page booklet. The instruments, machines and other physical facilities available to the 2500 resident students and 20,000 extension students are illustrated. *West Coast Univ., 1601 S. Western Ave., Los Angeles 6, Cal.*

Time cycle controller—Features of the company's five different models of Flex-O-Timer time cycle controllers for applications requiring all-electrical or all-pneumatic, or any specified combinations of each, are discussed. The 16-page bulletin shows how they control any particular group of functions which may be required in the sequence of a manufacturing operation. Photographs of complete instruments, sectional views and applications drawings illustrate the device. *Taylor Instrument Cos., Rochester 1, N. Y.*

Mechanical properties of laminated plastics at -70°, 77°, and 200° F., by John J. Lamb, Isabelle Albrecht, and B. M. Axilrod—Laminates of an unsaturated polyester reinforced with glass fabric, and of phenolic resin reinforced with asbestos fabric, high-strength paper, cotton fabric, and rayon fabric have been tested in impact, bending, tension, and compression at -70°, 77°, and 200° F. The results of these tests, of specific interest to the aircraft industry, are tabulated and presented graphically in this 33-page booklet. *Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.*

Chemical research—Data on several new chemicals which have become available from the company's research laboratories during the last year, and on which separate bulletins have been issued, have been compiled in a book titled "Collective Volume I." Some of the chemicals covered are arylbiguanides, guanylurea salts, beta chloropropionitrile, lactonitrile, succinonitrile, and potassium cyanate. *New Products Development Dept., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.*

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Adjustable-speed ACA motors—Complete descriptive and application data for this type of motor are contained in this 8-page booklet. The complete line of standard ratings now available are summarized, along with dimensional statistics for various models. *General Electric Co., Schenectady, N. Y.*

Mineral wool insulation for heated industrial equipment—For industrial and commercial users of insulation, designers of heated equipment, and insulation contractors, this 36-page standard is a guide for applying mineral wool insulation to sheet metal and brick surfaces. Specification data include density, thermal conductivity, incombustibility, and other physical information of value to buyers and specifiers. Twenty-six line drawings illustrate how to apply mineral wool to both flat and curved surfaces encountered in high-temperature installations. *Industrial Mineral Wool Institute, 441 Lexington Ave., New York 17, N. Y.*

Keystone specialized lubricants—Presenting the company's line of specialized lubricants for industrial and automotive machinery, this 30-page guide includes tested recommendations for lubricating all types of bearings under various operating conditions. Other information covers lubrication of power generation, transmission and materials-handling equipment, along with advice on lubrication of pump glands, valves and other machinery in contact with acids, alkalies and moisture. *Keystone Lubricating Co., 21st and Lippincott Sts., Philadelphia, Pa.*

Industrial film bibliography—Prepared under the direction of the National Metal Trades Association's committee on industrial education, this 100-page pamphlet offers pertinent information on audio-visual aids for supervisory and employee training programs. The comprehensive bibliography includes both sound and silent films. Non-members may get the guide for $2.00. *National Metal Trades Association, 122 S. Michigan Ave., Chicago, Ill.*

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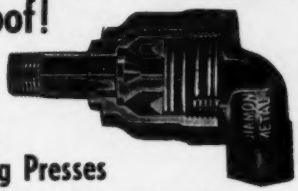

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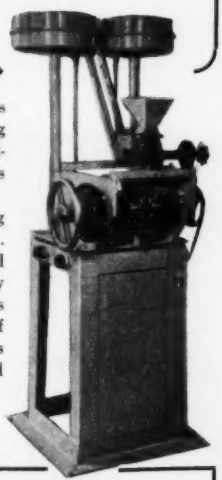

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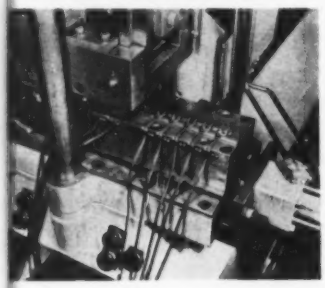
INJECTION MOLDER—Through the use of a set of duplicate molding cavities mounted one alongside the other, a new type automatic injection molding machine is said to offer solutions to several problems in the molding of plastic products with inserts. Developed by Moslo Machinery Co., 2443 Prospect Ave., Cleveland 15, Ohio, the recently introduced equipment, called Duplimatic, features a



self-positioning lower mold section, twice the size of the upper, one half of which can be cleared and reloaded while the other is engaged in the molding cycle.

At the start of the operation, one half of the lower mold is exposed to ready access by the operator. As soon as all inserts are placed and locked, control buttons are pressed, shifting the mold and placing the automatic cycle in action. Hydraulic action moves the lower section into position, the loaded cavities accurately aligned with the upper section. The mold is closed and a carefully metered injection charge is shot and timed with accurate, adjustable controls. Action is continued until the cycle is complete. Models of the unit are made in 2-, 3-, and 4-oz. capacities, with casting areas of from 20 to 40 square inches. Additional advantages include a torpedoeless stainless steel injection cylinder with even-heating features particularly favorable for nylon and vinyl molding; toggle and wedge mechanical clamping to eliminate flashing; and safety devices for the protection of the molding machine operators.

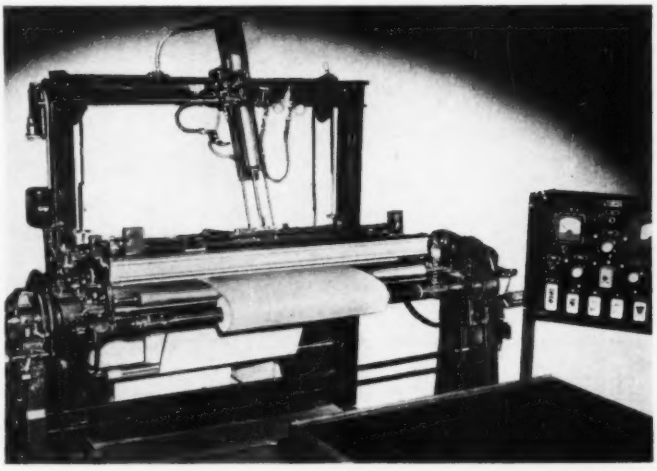
PRINTING MACHINE—Illustrations, decorations, trade marks and names, and advertising matter may be printed in all colors on plastic, glass, and metal objects of varied shapes with a new hand-operated, off-set printing machine designed by Apex Machine Mfg. Corp., 53 E. 10th St., New York 3, N. Y. Products with an area up to 3 by 4½ in. may be printed at a rate of from 500 to 800 pieces an hour on the unit.

The Apex machine prints by the transfer process. By merely pulling the hand lever forward and returning to position, the type is automatically inked, and an impression is made on the off-set transfer pad.

PLASTIC FILM WINDER—A new, high-speed, automatic, turret-type, center-drive wind-up for thin plastic film is being offered to the market by Adamson United Co., 730 Carroll, Akron, Ohio. Designed to receive a continuous film and wind it in selected lengths on paper cores, the equipment will cut and transfer the film from the full to the empty core in an instantaneous and completely automatic operation. Operator is required only to remove the full roll from the machine and replace it with an empty core. Selection of the length to be wound on each core is made by adjusting the dials of a yardage counter.

The winder is of the constant-tension type with total tension adjustable from 1 lb. up. Unit is suitable for operating at speeds from 15 to 150 yards per minute. The standard unit is arranged for film thickness up to 0.008 in. and widths up to 60 in., with total roll weight of 1000 pounds. Special modifications accommodate thicker and wider films.

DRILLING, TAPPING SPINDLES—Flexibility in drilling or tapping parts in steel with hole sizes up to and including 5/16 in. (on any type drill press) is made possible with the new convertible Ettco-Emrick adjustable spindle multiple head introduced by Ettco Tool Co., Inc., 594 Johnson Ave., Brooklyn 6, N. Y. Rapid and accurate spindle adjustments can be made from a minimum center distance of 1 1/16 in. to a maximum center distance of 5 5/8 inches. Spindle can also be located at any point within a 3 5/16-in. diameter circle. Use of the template method makes it a simple matter to locate spindles



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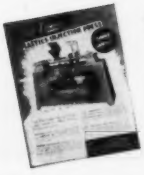

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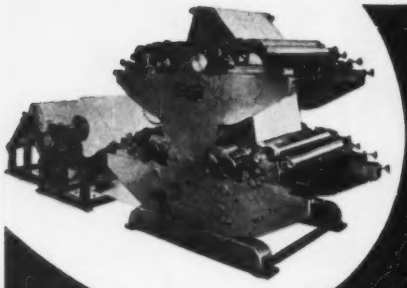

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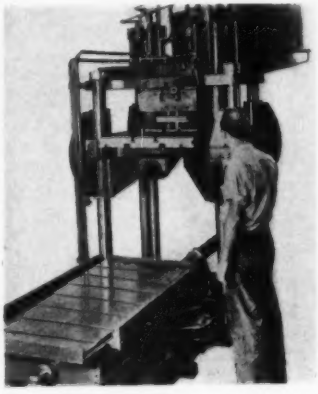
accurately for a given hole combination and to change their location swiftly from one drilling or tapping operation to another. With the bed plate, components are tied together like a punch and die. The adjustable spindle multiple head is available with 2, 3, 4, or 5 spindles. A special feature is the gear case which can be interchangeably bolted to a standard drilling and a standard tapping faceplate.

DIE MATCHING—Elimination of expensive and dangerous efforts by die-making teams to match parting lines on dies is the major objective of a new die-testing machine developed by Lester Engineering Co., 2711 Church Ave., Cleveland 13, Ohio.

In operation, two halves of the die are clamped to the two machine



platens. The bottom platen moves down and then out horizontally. The die is then sufficiently elevated and exposed to provide ample accessibility for working. It may be quickly moved in and up, in perfect alignment for checking. Dies tested on this equipment may be sent to the casting room without fear of subsequent flash. Specifications include: overall height, width, and length of 112, 68, and 136 in., respectively; locking pressure, 50 tons; die table size, 28 by 58 in.; machine weight about 15,000 lb.; and power supplied by a 10-hp. motor.

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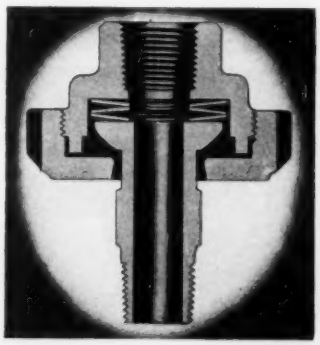
cooling by means of water, oil, steam, or other fluids. According to the manufacturer, Plastics Control Div., Sterling, Inc., Milwaukee, 12, Wis., the unit is entirely self-contained, consisting of a compact bellows-packed valve with stainless-steel trim and Monel bellows, a capillary tube, and a thermostat bulb. The flow through the valve is automatically modulated in accordance with the temperature at the bulb. Constant temperature, adjustable over a wide range, can be maintained at all times. It is built in two styles—direct-acting (valve closes as bulb temperature rises) for heating, and reverse-acting (valve opens as bulb temperature rises) for cooling. This valve has been used to control the flow of water through an oil-cooling heat exchanger on injection molding machines.

ROTARY SWIVEL JOINT—Turning torque is almost completely eliminated in a new rotary swivel pipe joint, for swivel and slow revolving applications, recently announced by Barco Mfg. Co., 1801 W. Winnemac, Chicago 40, Ill. A major feature of the unit's design eliminates wedge action of the ball against the gasket. An additional highlight is a small amount of side flexibility



said to reduce the possibility of breakage or wear from side strain. The joint performs without leakage at extreme temperatures, and will operate at continuous rotation up to 30 r.p.m. Capable of handling practically all fluids and gases, including corrosive acids and alkalies, the joint is currently available in 90° angle and straight designs in pipe sizes of from ⅜ to 1 inch.

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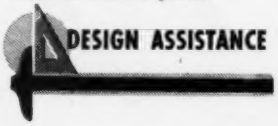
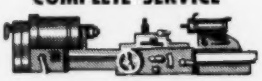
When you have Fortney make your molds, you are dealing with one of the oldest, most widely experienced moldmakers in the plastics industry. Fortney gives you the type of service you want — precision molds, made at sensible prices.

DESIGN ASSISTANCE



Fortney engineers will help you modify the design of your plastic product so that it can be molded economically.

COMPLETE SERVICE



Your molds are made *entirely* by Fortney—engineering, engraving, hobbing and hardening—your work is not "farmed out."

MOLD TESTING

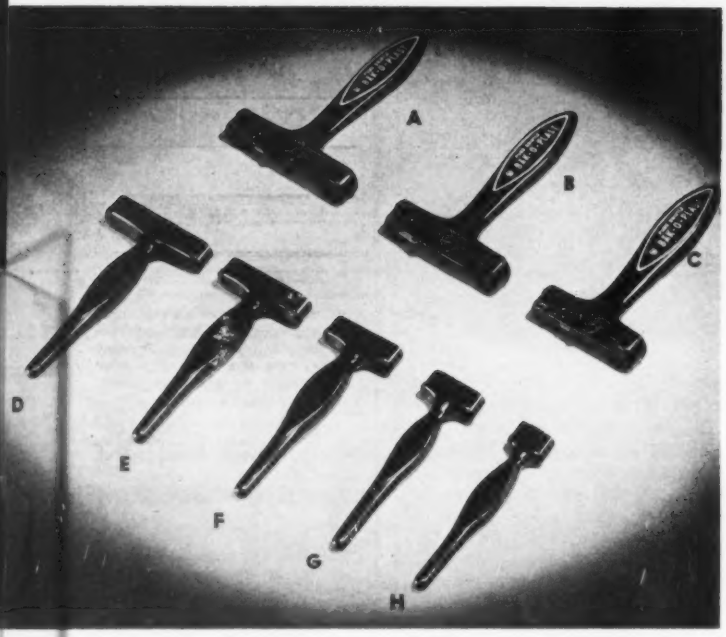
Before shipment, injection molds made by Fortney are tested on our own injection press. They are delivered ready for immediate production.

Phone or write for a consultation on your mold building problem, today.

FORTNEY MFG. CO.
incorporated
247 N.J.R.R. Avenue, Newark 5, N. J.
Phone MA 2-2845

PLASTICS STOCK MOLDS*

APRIL 1950



Paint brush handles made of phenolic in black. Trade name may be imprinted by Markem or Roll Leaf process. Dimensions given at point of ferrule fitting.

A—4 in. wide, 7/8 in. thick, 6 1/4 in. long without bristle.

B—3 1/2 in. wide, 7/8 in. thick, 6 1/4 in. long without bristle.

C—3 in wide, 7/8 in. thick, 6 1/4 in. long without bristle.

Handles A, B, and C are made in molds with movable inserts so that lettered panels as shown may be produced.

D—3 in. wide, 5/8 in. thick, 5 5/8 in. long without bristle.

E—2 1/2 in. wide, 5/8 in. thick, 5 5/8 in. long without bristle.

F—2 in. wide, 9/16 in. thick, 5 1/2 in. long without bristle.

G—1 1/2 in. wide, 1/2 in. thick, 5 1/4 in. long without bristle.

H—1 in. wide, 7/16 in. thick, 5 in. long without bristle.

A to H—from Shaw Insulator Co., 160 Coit St., Irvington 11, N. J.

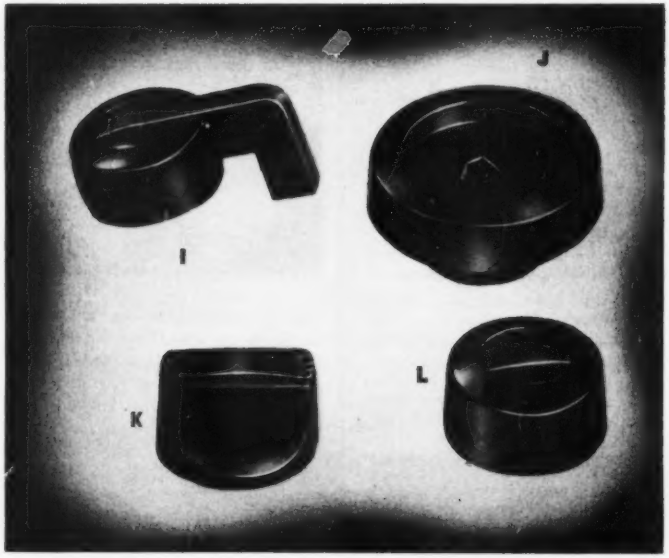
I—Channel selector television knob S-634 has eight impressions in mold. Made of urea or phenolic in standard colors, knob is 1 5/8 in. long and 1 in. wide.

J—Vernier television knob S-635 has 16 impressions in mold. Made of urea or phenolic in standard colors, knob is 1 1/2 in. o.d.

K and L—Volume control knobs S-636 have 24 impressions each in mold. Made of urea or phenolic in standard colors, knobs are 1 in. o.d., 1/2 in. thick.

I to L—made by Kurz-Kasch, Inc., 1421 S. Broadway, Dayton 1, Ohio.

Molders are invited to submit samples of stock products to be described on this page as space permits. Address samples and detailed information to Stock Molds Editor, Modern Plastics, 122 E. 42nd St., New York 17, N. Y.



*Reg. U. S. Pat. Office.

the new polymeric
vinyl plasticizer
PARAPLEX G-60 is
• permanent
• low-cost
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• low in viscosity
• light in color
• widely compatible
• efficient at low temperatures
• stable and non-volatile at fluxing temperatures
• a combination plasticizer-stabilizer
• excellent in all vinyl compounding, especially in solutions and dispersions
• thoroughly described in technical literature obtainable by writing to Dept. MPL-1.

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ROHM & HAAS COMPANY

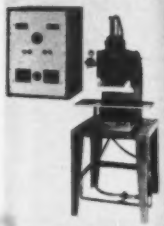
THE RESINOUS PRODUCTS DIVISION

Washington Square Philadelphia 5, Pa.

The Resinous Products Division was formerly The Resinous Products & Chemical Company

PARAPLEX is a trade-mark, Reg. U. S. Pat. Off., and in principal foreign countries.

BAR SEALERS & GENERATORS for all production requirements

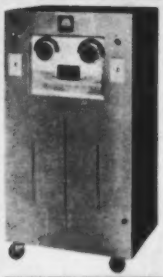


highest production consistent with superior sealing!

H. F. Generator 1.5 KW output
Press 12" x 24" work bed

all parts and tubes specially engineered!

H. F. Generator 3 KW output

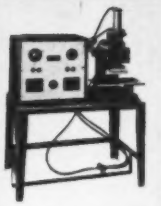


no surplus parts used!

Press 10" x 15" work bed

all circuits identical for a given output!

H. F. Generator 700 watts output
Press 10" x 15" work bed



A unit for every purpose. Tested and proven!

write for details
state your requirements

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MANUFACTURING CORP.
1907 White Plains Road • New York 60, N. Y.

Production of

FOR THE purpose of this report, production is the sum of the quantities of materials produced for consumption in the producing plant, for transfer to other plants of the same company, and for sale. Sales include only the quantities involved in bona fide sales in which title passes to the purchaser.

The figures of sale given in the present report are not comparable with those for consumption in the producing plants plus shipments to other plants

PLASTIC AND SYNTHETIC RESIN PRODUCTION
From Statistics Compiled

Materials	*Total Prod'n 1949*
CELLULOSE PLASTIC:[a]	
Cellulose acetate and mixed ester plastics:	
Sheets, continuous:	
Under 0.003 gage	7,062,502
0.003 gage and over	7,787,386
All other sheets, rods and tubes	4,322,300
Molding and extrusion materials	55,888,602
Nitrocellulose:	
Sheets	5,610,608
Rods and tubes	1,446,008
Other cellulose plastics[b]	8,518,882
PHENOLIC AND OTHER TAR ACID RESINS:	
Laminating	40,401,445
Adhesives	27,161,437
Molding materials[a]	131,083,719
Protective coatings (containing less than 10% modifier)	17,353,389
Miscellaneous uses, including casting	42,773,532
UREA AND MELAMINE RESINS:	
Adhesives	43,017,921
Textile- and paper-treating resins	30,054,913
Protective coatings, modifier and unmodified	18,584,199
Miscellaneous uses, including laminating and molding[c]	48,523,972
STYRENE AND STYRENE DERIVATIVE POLYMER AND COPOLYMER RESINS:	
Molding materials[a]	183,884,041
Miscellaneous uses[d]	29,601,973
VINYL RESINS:	
Sheeting and film, including safety-glass sheeting[a]	157,545,346
Adhesive (resin content)	11,945,578
Textile- and paper-treating resins, including spreader and calendering types (resin content)[e]	29,472,595
Molding material (resin content)	81,842,161
Miscellaneous uses (resin content)[e]	17,550,090
MISCELLANEOUS SYNTHETIC PLASTICS AND RESIN MATERIALS:	
Molding materials[b, f]	44,235,922
Protective coatings[c]	51,477,726
All other uses[b]	157,979,455

[a] Includes fillers, plasticisers, and extenders. [b] Includes sheets, rods, and tubes, and molding and extrusion materials. [c] Data on resins for laminating and miscellaneous uses are on a dry basis; data on molding materials are on the basis of total weight. [d] Excludes data on protective coating resins; these data are included with miscellaneus coating resins to avoid disclosure of operations of individual companies.

Plastics Materials

given in earlier reports. The figures for production given in the present report, however, would be comparable with figures for consumption in producing plants plus shipments given in earlier reports except for inventory changes. From month to month these changes in inventory may be substantial in amount, but over several months the figures will tend to even out.

IN POUNDS FOR NOVEMBER AND DECEMBER, 1949
by U. S. Tariff Commission

November 1949		*December 1949*	
Production	*Sales*	*Production*	*Sales*
678,698	691,157	717,220	730,610
868,071[1]	737,712[1]	570,674	571,675
415,284	321,876	386,344	313,945
5,182,807	5,118,021	4,637,786	4,350,777
334,036	381,507	373,356	438,757
105,709	112,731	111,433	93,731
950,142[1]	905,735[1]	971,514	807,986
3,954,173	2,604,856	3,645,414	2,083,578
2,602,764[1]	2,454,755[1]	2,444,339	2,188,812
17,721,177	14,769,680	15,942,889	11,034,458
1,763,795	1,097,748[1]	1,717,006	1,010,869
4,406,339[1]	4,347,650[1]	3,771,926	3,880,193
5,023,680[1]	4,731,438[1]	4,807,505	4,483,857
3,497,112	3,006,530	3,336,115	2,634,958
2,174,411	1,647,005	1,834,042	1,390,289
5,047,509[1]	4,936,354[1]	5,267,929	4,346,640
17,904,390	18,711,862	17,235,554	16,695,712
2,996,228	2,586,686[1]	2,901,737	2,642,921
18,170,634	17,704,784	16,567,070	13,664,043
1,244,731	1,133,647	1,147,014	992,258
3,094,218	2,954,098	2,955,577	2,461,597
9,254,235	8,675,776	10,585,984	9,347,142
1,739,618	956,996	1,780,652	786,121
3,516,618	3,875,893	3,658,280	3,029,022
5,168,203	5,098,051	3,435,984	5,221,509
15,192,173	14,314,322	15,202,775	14,470,061

[a] Includes data for spreader and calendering type resins. [2] Includes data for acrylic, polyethylene, nylon, and other molding materials. [3] Includes data for coumarone-indene, petroleum, silicone, and other protective coating resins. [4] Includes data for acrylic, alkyd, coumarone-indene, nylon, petroleum, silicone, and other plastics and resins for miscellaneous uses. [1] Revised.

Plastallions

for

GOODWILL ADVERTISING

DEALER AIDS

SALESMEN'S KITS

Until they discovered Plastallions, Philipp Bros., Inc., exporters and importers of ores and metals, were unable to distribute anything symbolizing their work to customers and friends.

Because Plastallions, which are brilliant transparent compression molded acrylic pieces, dramatize difficult to display items and printed messages which are embedded in them, they were a "natural" for Philipp Bros. The Plastallions distributed by Philipp Bros. contained a silver dollar and a smart metal nameplate. After distribution of these eye-catching Plastallions, hundreds of complimentary letters were received by Philipp Bros.

Many other enterprising companies are using Plastallions in stock molded shapes such as plaques, key tags, coasters, ash trays, etc. In them they are embedding their entire lines or suitable products and advertising messages for goodwill advertising, as dealer aids, and in salesmen's kits. Examine actual Plastallions and learn about their selling power in Booth 249 at the National Plastics Exposition or write for *free literature.*

and remember . . .

The most dramatic single sales aid you can give your sales force and dealers is your product *plus* your sales story . . .

EMBEDDED

in crystal clear

Plastallions

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NEW

poly supra colors for injection molding

Perfect Colors at Savings of Five Cents per Pound and More!

One simple weighing . . . One simple mixing!

Tumble Krieger Poly Supra Colors with your crystal styrene or polyethylene for just fifteen minutes . . . then mold as usual. The results are amazing!

Costs for coloring range between 1/10¢ and 1½¢ per pound . . . a clear saving of at least 5¢ per pound over standard colored materials.

Write for samples and prices

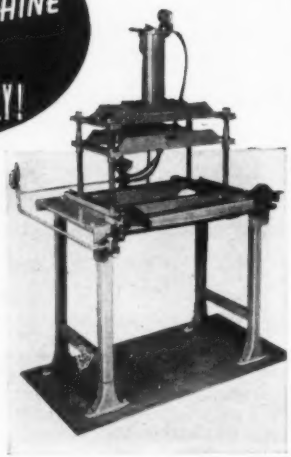
KRIEGER COLOR & CHEMICAL CO.
INCORPORATED
6531 Santa Monica Blvd., Los Angeles 38, California
Phone: Hillside 7361

Opaque and transparent in a complete color range including metallics and fluorescents. Special colors matched upon request.

SENSATIONAL NEW DEGATING MACHINE CAN SAVE YOU OVER $100 WEEKLY!

The Lindex Degating Machine was developed by injection molders who *had* the same problem you *have*—the inefficiency of degating multiple-cavity shots by hand. This air operated unit permits your pressman to degate up to 200 sprues per hour *without any extra help.* Think of the money you can save! Just run through the facts and features on the new Lindex Degating Machine . . . then decide if you can afford to operate without one.

- Machine can usually be written off completely within 6 or 7 weeks—on savings of labor alone
- Degates sprues containing any number of cavities
- Makes clean cuts on all materials—pieces need no finishing or deburring
- Different pieces on a sprue can be segregated automatically as they are degated
- Inexpensive degating dies can be purchased from Lindex . . . or can be made in your own shop with little equipment
- Press opening is 10" high . . . gives operator lots of room to set sprues on die
- 12" x 24", opening thru bed 10¾" x 23". Degating units for special sizes built on request
- Safety feature—requires both hands to activate cylinder



Write for prices and Folder D200

Lindex CORPORATION
208 EAST 23rd STREET
NEW YORK 10, N. Y.
LExington 2-2247

London Letter

News and Notes on Trends in the Manufacture and Application of Plastics in Britain

MANUFACTURERS of leather belting in Great Britain are showing a great deal of interest in the production of a new type made by spreading p.v.c. paste onto a strong webbing base. British Belting and Asbestos Co. Ltd., is making this type of belting, which is reported to have excellent durability.

Number wheels and pinions for use in direct reading meters for electricity, gas, and water are now being successfully molded of acrylic material. These acrylic parts are less expensive to produce than the familiar tin alloy parts. A. J. Thorman Engineering Co. Ltd., Boreham Wood, Herts, is injection molding acrylic number wheels and pinions for home and foreign markets.

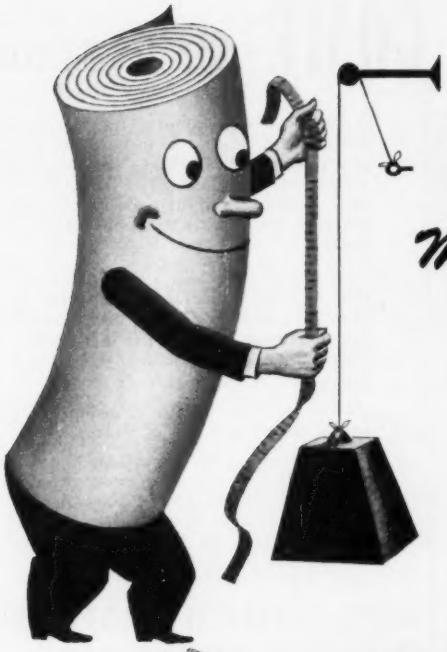
In the new House of Commons designed by Sir Gilbert Scott, Perspex acrylic sheet fluorescent-lighting fittings are being installed. General Electric Co. Ltd., London, is responsible for the installation of approximately 1000 of these units.

The British plastics industry has benefited quite appreciably from the National Health Service because of the increased use of its products in the health program. One of the neatest of these aids is the Medresco Hearing Aid made to specifications issued by the Medical Research Council. It is molded by Kent Mouldings, Sidcup, Kent.

Availability to the British plastics industry of a wide range of pure fatty acids, saturated and unsaturated, will be assured by erection of a new plant at Littleborough, Lancashire, by Hess Products Ltd., Leeds. This plant will distill fatty acids by a fractional process, under patent rights acquired from Armour & Co., Chicago.

In the field of p.v.c. calendered sheet for rainwear, British stores report increasing sales for the transparent grade which is being made in thicknesses of 0.004 in. and above in

(*Continued on p.* 191)



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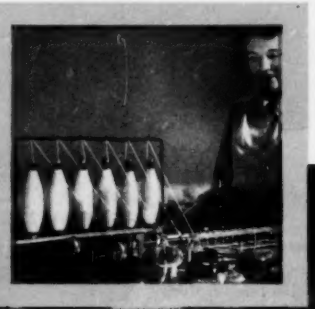

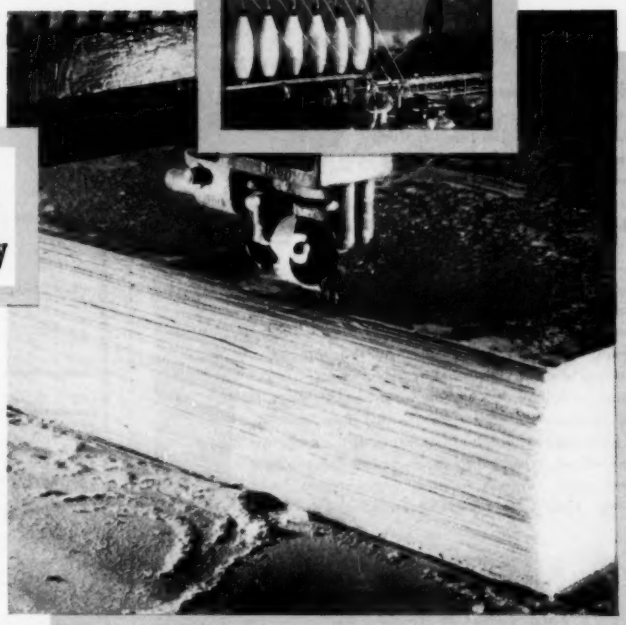

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Greater Fabric Uniformity

The rigid laboratory checks which control the production of Mt. Vernon Extra fabrics assure the high degree of uniformity you need for dependable lamination.

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Akron

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POSITIVE TEMPERATURE CONTROL
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We cordially extend to the plastic industry an invitation to inspect our modern new plant. We have an extensive laboratory with complete facilities for testing and developing processes for any plastic parts requiring a smooth, lustrous finish.

We also operate a school of instruction in tumble finishing techniques for those who care to discover the possibilities of improving their product, increasing production and reducing their polishing costs.

The services of our laboratory and school are offered free of charge.

When you visit our plant, you will also see the most unique museum of its kind in the world. Over 28,000 pieces—covering a history of more than 35 years of pioneering in the field of plastic, metal and jewelry polishing.

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widths of 36, 48, 54, and 60 inches. Commercial Plastics, Ltd., London, is one of the firms specializing in this product.

Infra-red pre-heaters for thermosetting molding shops are now becoming increasingly popular. They are less expensive, more economical to operate, and their small size enables the heater to be placed conveniently near the press. Heaters made by British concerns, such as General Electric Co., Ltd., have thermostatic temperature controls.

Competition in the acetate market is increased by the availability of imported French Rhodoid for the British home market. This is offered by M & B Plastics, Ltd., London. Before the war, Rhodoid was popular in Britain and competed on favorable terms with leading home produced brands. At the present time the trade in acetate is difficult. Molding powder is plentiful but orders are scarce.

Squeezable containers made of p.v.c. are now attracting attention among British packagers. Advantages claimed for the p.v.c. bottles include ease of production and low cost. Creators, Ltd. is now making p.v.c. containers.

The British Plastics Federation's stand at the B.I.F. (1950) is being shared by some 16 important member firms who have not taken individual space at the Fair. This indicates that British plastic firms are sceptical about the sales-pulling power of the Fair. It is considered unlikely that there will be a separate Plastics Section at the B.I.F. in 1951, because many individual firms prefer to show their products in other sections.

British molders who have investigated the use of plastics in the textile industry report that lack of standardization of bobbins and pirns, of which there are more than 600 sizes and shapes, is likely to prevent the wide use of molded phenolic components. Efforts to encourage standardization are being resisted by textile machinery component manufacturers which are reported to be in control of the market.

—John S. Trevor

The PERFECTED
Solid Vinyl Floor Tile
BEAUTIFUL
GREASE RESISTANT
CHEMICAL RESISTANT
UNUSUALLY DURABLE
MOISTURE RESISTANT
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NEEDS NO WAXING
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Surflex
VINYL PLASTIC FLOOR TILE
The loveliest surface that can grace any floor is SURFLEX Vinyl Plastic Floor Tile. This solid vinyl floor tile is engineered to give every desirable characteristic a floor covering should have. It has been thoroughly tested in the laboratory and in field use.
Compare the clarity of its colors that extend through to the back of the tile. Here is Color and Beauty Forever!
SEE IT AT THE PLASTICS SHOW ★ BOOTH #217
Surprenant
MFG. CO.
199 Washington St., Boston 8, Mass.

HERE'S HOW

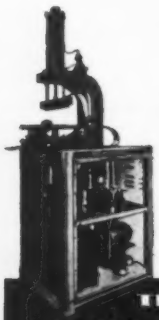
Thermatron

HIGH FREQUENCY SEALER

"SEAMS" TO VANGUARD

VANGUARD" Humpty-Dumpty is electronically seamed by THERMATRON, and if he *did* have a "great fall" he'd still be in one piece thanks to the process THERMATRON pioneered. Vanguard Corporation of Chicopee, Mass., a recognized leader in the field of plastic fabrication, produces a wide variety of charming inflated toys and novelties, all "cost-cut" by THERMATRON welding.

Another famous manufacturer—Clarvan Corporation of Milwaukee, seams its "Plastimitts" (illustrated) on the THERMATRON as well as the other plastic products in its extensive line. Mr. F. G. Edelston, General Sales Manager, recently said, "Independent laboratory tests show our electronically seamed bowl covers outwear the ordinary sewn variety three to one!"



If you work in vinyl plastics, investigate THERMATRON. It is the modern way to speedy, more economical mass production—produces stronger, airtight, water-tight seams. Frequently does it better in one low-cost operation what a power sewing machine doesn't do so well in *several*.

▶ **THERMATRON is built in a variety of models from ¼ KW to 6 KW, suiting most requirements — or can be designed to meet your special needs. Equipment also available for sealing cellulose acetate. Our engineers will be glad to recommend solutions to your plastic sealing problems without obligation.**

▶ **Our illustrated folder No. 52 describing the THERMATRON line and its industrial uses is available upon request.**

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Write for particulars

FOREMOST MACHINE BUILDERS, INC.

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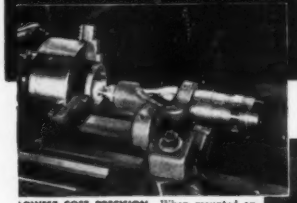
ACCURACY TO .0001" IN PRODUCTION SET-UPS

FOR AS LITTLE AS **$117.50**



Internal grinding on lathe with PRECISE wheel arbor mounting 1½ D. wheel.

LOWEST COST PRECISION. When mounted on standard machine tools, PRECISE SUPER 40 at speeds from 20,000 to 45,000 R.P.M. turns out precision jobs heretofore possible only on stationary machines costing up to 100 times as much.

VERSATILITY. For cylindrical, internal, external and form grinding; for milling with H.S. steel or tungsten carbide midget mills; for microfinishing and polishing. Use on wood, glass, rubber, plastics, or any metal including the hardest alloy steel.

DURABILITY. All metal housing, rigid PRECISE quill, lubricant-sealed micro-precision bearings, ¼ H.P. AC-DC motor (115 volts) is protected by replaceable fusetrons.

ATTACHABLE COOLFLEX SHAFT. (optional) Quickly attached for bench work and handtool applications. Same speeds, same precision quill as in PRECISE SUPER 40.

Milling hardened die with tungsten carbide mill in COOLFLEX ATTACHMENT.

Write FOR CIRCULAR

PRECISE PRODUCTS CO., 1348 Clark St., Racine, Wis.

PRECISE SUPER 40

Main egg-beater handle is high acetyl; small one is plain acetate

Hardier Handles

(*Continued from p. 95*)

knives and carving sets. The latter material provides the beauty of wood with increased hardness, dimensional stability, and durability of finish. Unlike wood, this plastic presents no problem with regard to water absorption.

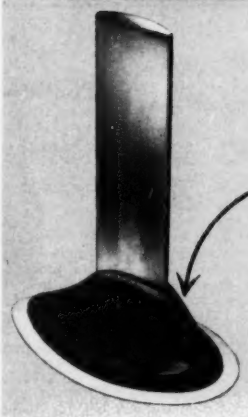
Cost Saving

Although Ekco's principal interest in plastic handles is from the standpoint of improved appearance or performance, there are also instances in which an actual cost saving was realized in changing over to plastics. One such case involves the knob-type handles on a lightweight line of aluminumware utensils. These were formerly turned of wood and tumble-finished, having an opening at the bottom into which a flaring aluminum rivet was inserted for attachment to the lid. These are now being replaced by phenolic handles having a molded-in aluminum stud which is inserted through the lid and spun down, providing a more attractive, durable assembly at lower cost.—END

Simulated stag handles on carving set are specially treated phenolic

FORMICA goes along when radar goes aloft!

PHOTO COURTESY USAF AIR MATERIEL COMMAND



Modern Air Force Bombers carry their own radar. And the antenna base for this sky-scanning system is molded from Formica's Grade YN-25, a nylon cloth base laminate, bonded with phenolic resin.

Wilcox Electric Co., manufacturers of the unit, specified YN-25 for its unique combination of high dielectric strength and mechanical toughness. Subjected to all weather conditions and to a beating from abrasive gravel on take-offs and landings, YN-25 has proved to be "the grade that makes the grade."

Electronics industries find many uses for Formica YN-25 in applications calling for low power loss factor, high moisture resistance and outstanding mechanical strength. YN-25 is available in sheets, tubes and rods.

Whatever your requirements, Formica can meet them with one of more than 40 standard grades, or with a grade "custom-tailored" to order. Write FORMICA, 4531 Spring Grove Ave., Cincinnati 32, Ohio.

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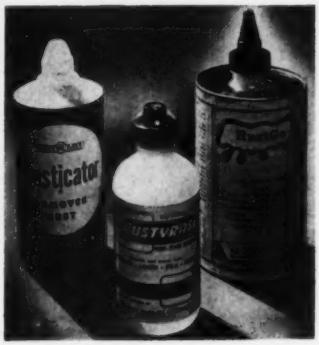

COURTESY PLAX CORP.

Three different brands of rust removers are packaged in polyethylene, eliminating breakage problem

Squeeze Does It

(*Continued from pp. 97-99*)

top for improved spray action. Air space is hidden by the use of a stipled effect.

The product was first identified by means of neck tag due to the fact that at that time no ink had been developed which would satisfactorily adhere to polyethylene. Next came a paper label which was secured to the bottle with rubber cement. In 1948, specially formulated inks made it possible to imprint the bottle directly.

All the Stopette bottles, includ-

Cologne is packaged in squeezable, stippled polyethylene bottle. Bottle simulates lamp post in design

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ing the supplementary 1-oz. bottle introduced in 1949, are produced by Plax Corp. Formold Plastics, Inc., Chicago, Ill. molds the polystyrene cap and spray assembly, with its 0.008-in. orifice, while Elmer E. Mills Corp., Chicago, Ill., supplies the extruded polyethylene tubing used in the spray assembly.

Applications Growing

The tremendous expansion of applications for the polyethylene container, whether it be a squeeze-spray, shaker, or pour-out type, has taken place despite the fact that glass bottles are cheaper. Improvements in spray plugs, closures, private-mold shapes, printing and labeling, and merchandising techniques, plus recent price cuts, are bringing the polyethylene bottle down to a more competitive level with glass.

The successes of the bottle have aroused the interest of many molders. Plax Corp., which is by far the largest molder of these containers, was producing at the rate of 50 million bottles in 1949 and is shooting for the 100 million mark in 1950.

In the face of a glass bottle production of 12,672 million, this projected production looks small indeed. But the obvious advantages of the polyethylene bottle—protection, convenience, economy, and sales appeal—may be expected to produce specialized applications in practically every field, which is bound to result in tremendous volume.—END

The Shulton shampoo bottle indicates the effectiveness of raised lettering and an embossed design

COURTESY PLAX CORP.

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A Guide to the Properties You May Be Seeking

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Silene EF is a white, very finely divided, precipitated hydrated calcium silicate with the following approximate analysis:

SiO_2	65.0	Bulk Density—Lbs. per cu. ft.	10±2
CaO	18.5	Oil Absorption	120-130
Loss on Ignition	15.0	Particle Size	Average 0.03 micron
pH in water suspension	9.6		
Specific Gravity	2.1		
Refractive Index	1.475		

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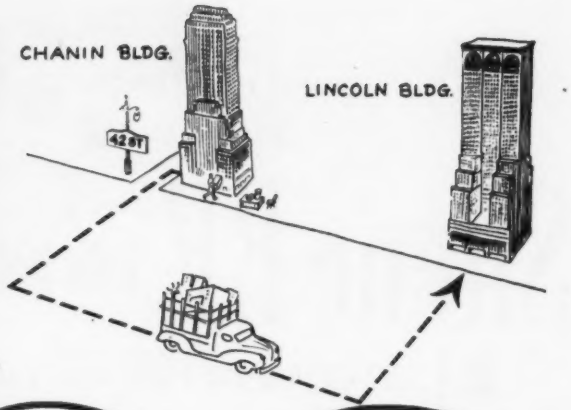

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SPRUES AND GATES

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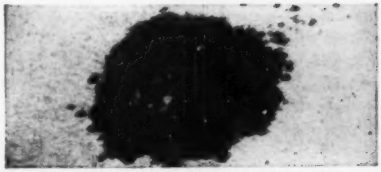

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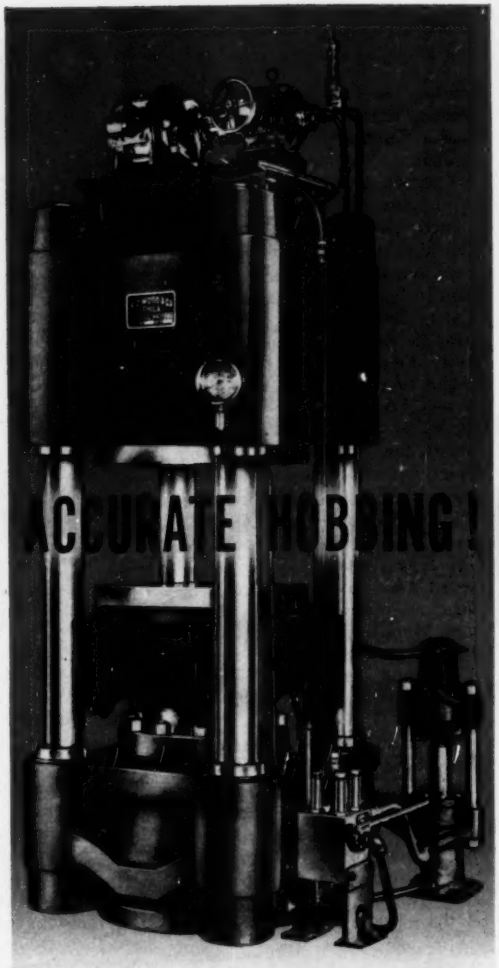

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Est. 1803

R. D. Wood Company

Beads by Billions

(*Continued from pp. 100-101*)

brackets from 15¢ for a string of 92 beads to $10.00 for the same size of item and up to $20.00 for pearl ropes of high quality. On a 15¢ item including 92 graduated beads plus string plus clasp plus at least a printed card as a package, and allowing a 40% profit for the retailer, a manufacturer must be most efficient in his operations and in controlling his costs.

Plastic cores for simulated pearls have proved superior to glass in weight, affinity for the coating, uniformity and durability. They are also easier to string and handle. As to cost, they are naturally low, but there are now coming in from Japan glass pearl-bead cores considerably below the price American plastic bead makers must charge for even a non-profit operation. In fact, coated-glass simulated pearls, complete, are coming in from Japan, under subsidy by the U. S. taxpayer, at a price less than the cost of stringing alone in this country.

Pearlescent Acrylic Beads

Late in 1939, Du Pont introduced a pearlescent Lucite, cast in rod form, in which the pearlescence, incorporated in the monomer, orients itself parallel to the surface of the rod. Meyer worked with Du Pont in evaluating this development and while Du Pont took out patents on the incorporation of essence in the monomer, the Meyer concern secured patents covering the production of beads from the material. The "cat's eye" effect of beads made from this material has never been duplicated in any other material. Ace Plastic Co., Jamaica, N. Y., and Meyer pioneered the grinding of beads from it.

Beads of various sizes, shapes, colors are made of cast phenolic

COURTESY ACE PLASTIC CO.

COURTESY JOS. H. MEYER BROS.

Necklace is made of metal beads combined with acetate-cored pearls

During the war, production of the material was suspended; after the war, it was found more economical and just as effective to extrude the material into rods; so Du Pont gave up the casting operation. Today, Meyer, Ace, and Commonwealth Plastics Corp., Leominster, Mass., operate under the Meyer patents. Ace and Commonwealth sell to the jobbing trade; Meyer strings under its own brand. Meyer polices the patents carefully, prepared to crack down on infringers. Tell and Commonwealth are making pearlescent acetate beads under Meyer patents.

Other Plastics in Beads

A recent development is the making of pearlescent polystyrene beads from a special material developed by Westchester Plastics, Inc., Mamaroneck, N. Y. These beads, made by several extruder-grinders, are low cost and quite unique in appearance. Another new development is the colored and mottle effect Lucite beads made by A. Newman & Co., Long Island City, N. Y., from rod produced by Sussex Plastics Co. of the same city. These beads contain no pearlescence yet provide a most unusual effect, somewhere between a pearlescent and a tortoiseshell. The ambers, metallics, and jade shades are becoming popular, Newman is prepared to match color swatches in this material.

This year a plastics bead replaces the colored china and enamelled wood beads so popular in dress ensembles. Coro introduced the trend. Others are following. An interesting angle is that the plastic alone has not enough sheen or glow after grinding and tumbling to suit the needs of the wearers. So the acetate beads are dipped in lacquers and enamels in various pastel shades.

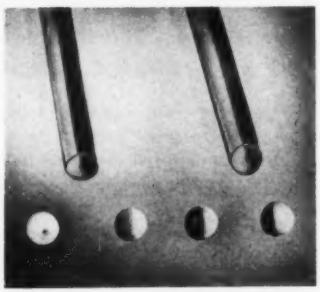
The long-known cast phenolic beads are back again in greater favor this year. These are ground from Catalin and Marblette rod, drilled and strung in graduated strands. Ace Plastic has made a specialty of this work.

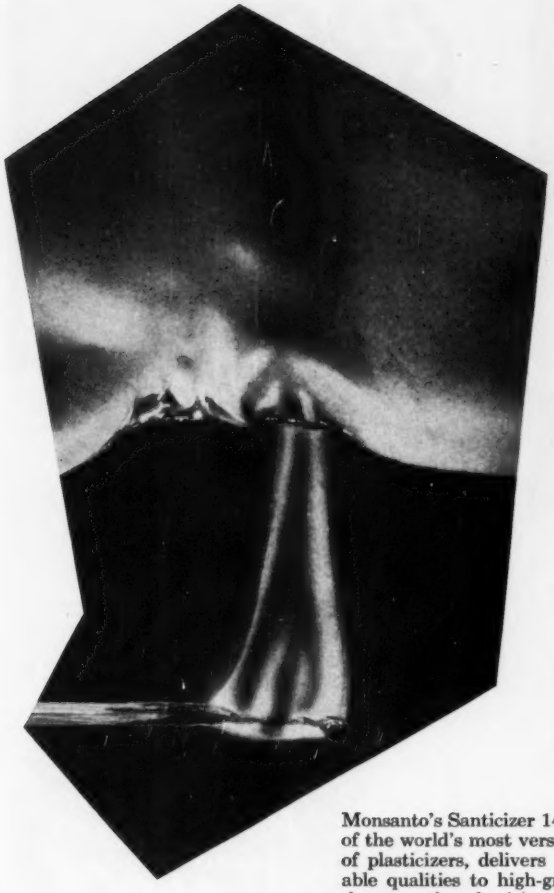
Beads, beads, beads—plastic beads. In one size of simulated pearl bead alone (8 mm.) the industry uses 30 million a week! Add all other sizes, all other finishes, all other materials, and you have half a billion plastic beads a month. They're better because they're plastic.

Then, figure that from every 100 lb. of extruded bead rod a centerless grinder produces about 45 lb. of beads, and some idea can be gained of the economics involved. Tell Mfg. Co., Inc., has recently completed installation of huge equipment to recover waste acetate from the grinding process. Foreign competition from glass (even if subsidized) may thus be confounded!—END

Two-color acetate beads are fabricated from extruded rod stock

COURTESY SUSSEX PLASTICS CO.





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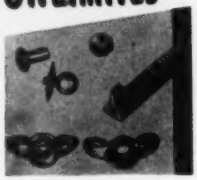

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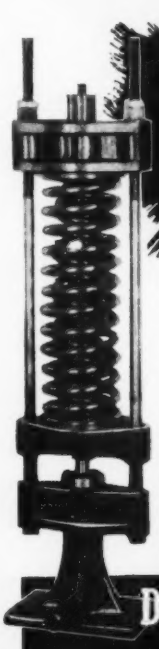

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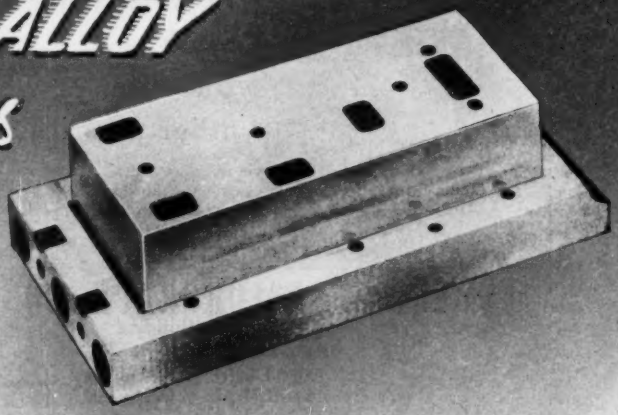

Typical of the favorable comments being made concerning *Speed Alloy* hot rolled alloy steel plates — the new Holliday Speed Steel — is the report of the W-L Molding Co., Kalamazoo, Mich. One of eight cores for an eight cavity plastic mold made by this firm is shown. They are highly enthusiastic over the ease of machining and hardenability of *Speed Alloy*.

"Machinability was good on these cores. Parts came out of carburizing treatment with 56-58 Rockwell C surface hardness and no change in size or shape of the parts. Wall thickness in the thinnest section, between oblong slot and outside wall is .045". This thin wall remained perfectly straight. The holes or slots are for tool steel inserts. The cores were readily polished to a mirror finish."

Speed Alloy bridges the gap between carbon and tool steels. The chromium and molybdenum content assure deep hardening properties. Plates available from stock to 72" wide and thicknesses up to 6". Send for Bulletin 905.

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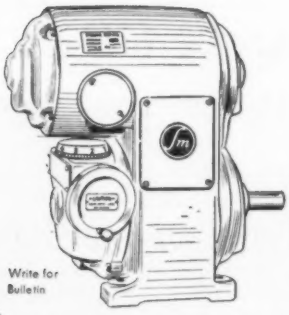

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Moth-proofing attachment (inset) for cleaner is molded of acetate

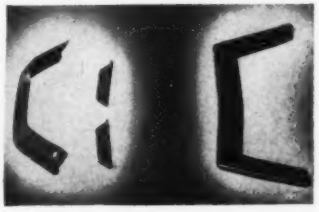
Plastics in Cleaner

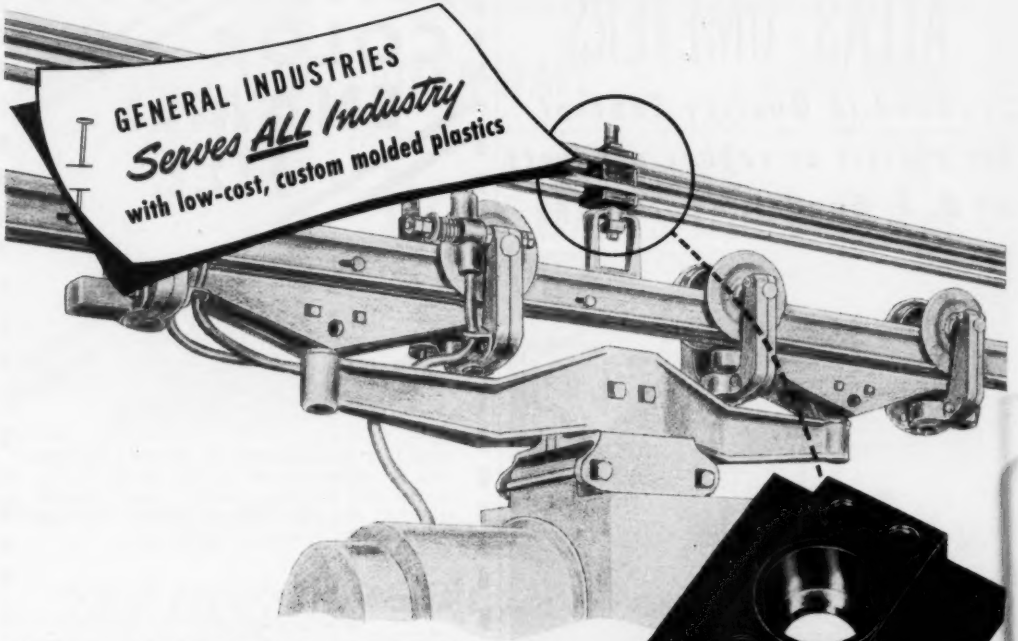
(*Continued from pp.* 102-3)

trap lid went from black phenolic to gray polystyrene, injection molded by Vlchek Tool Co., Cleveland, Ohio. Ribs were added to strengthen the polystyrene.

Before the war, the headlight bumper on the cleaner was made up of three pieces of extruded rubber. Redesign made a molded bumper imperative, but high mold costs made a one-piece bumper impractical in rubber because a 30-cavity mold would have been required to get adequate speed of production in rubber. Now, in a 2-cavity mold, available at reasonable cost, Yardley Plastics Co., supplies over 1000 one-piece vinyl bumpers every production day.—END

One-piece vinyl bumper (right) is molded. Rubber one was extruded





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No, this isn't a particularly intricate molding job—not for General Industries. But a top-notch plastics molder doesn't build his reputation solely on molding skill . . . he must be dependable, too—able to deliver *any* type plastic parts *when* and *as* they're needed by his customers.

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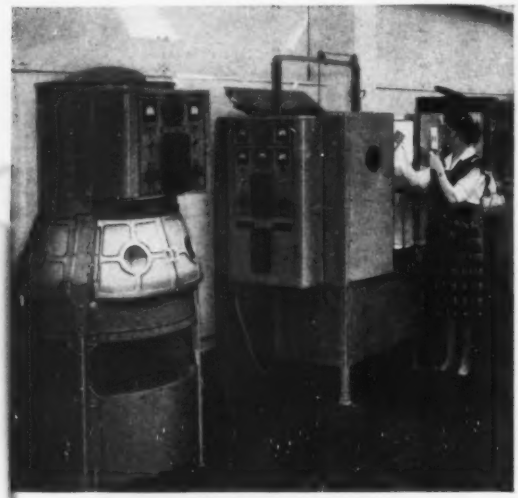
ATLAS-OMETERS

. . . used in Quality Control for plastic or rubber products at B. F. Goodrich Company



An important part of the tests at B. F. Goodrich Company Laboratories involves subjecting products to the destructive effects of weathering conditions they will be expected to meet in service. By using Atlas Fade-Ometers and Weather-Ometers it is often possible to obtain quickly, in advance of actual service, assurance that new materials will have satisfactory resistance to cracking, sun-checking, chalking, fading or bleeding of color, or to loss of elastic properties.

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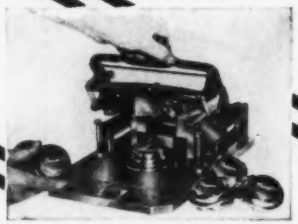

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SCALE ENGINEERS IN ALL PRINCIPAL CITIES

Specimen cup can be snapped onto deflector. Both are made of butyrate

Junior Gets Choice

(*Continued from pp.* 107-8)

will be expected to use it without assistance.

Molded Accessories

The deflector which snaps on to the front of the seat is also molded of butyrate by Amos Molded Plastics. Deflectors for the wooden seats were originally made of rubber, and the company has continued to offer the rubber deflector as well as the plastic deflector. However, the butyrate deflector costs about 15% less than the rubber and thus outsells it about eight to one.

Butyrate is used for a specimen cup, which can be attached to the bottom of the deflector when necessary. This unit has been offered only in plastic.

The Toidey Co. also produces a base and pan for use with the seat. The pan was originally made of metal and weighed 18 ounces. It is now molded of transparent polystyrene which costs 15% less and weighs only 5½ ounces. In addition to the ease of handling which results from the decrease in weight, the visibility afforded by the transparent pan is an asset to the mother in training the child.

Such is The Toidey Co.'s experience with plastics: a better seat at the same cost; a better deflector for 15% less; a new product (the specimen cup) created in plastic; and a better pan for 15% less.—END

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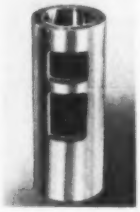

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The plastic uke comes packaged in a polyethylene bag, which is re-usable

Ukuleles Go Plastic

(*Continued from pp.* 108-9)

marked deadening of sound in the completed instrument. According to the manufacturer, the selected adhesive further strengthens the polystyrene parts against the effects of dryness, moisture, heat, or cold.

In addition to giving music lovers a popular-priced, high quality professional instrument, French American has put into effect one of the most unusual packaging jobs seen in this field. The ukuleles, properly labeled, are simply inserted into polyethylene bags and the tops are closed by means of rubber bands. The bags, of course, are re-usable as refrigerator bags.

In the short time that the Islander has been on the market, over 35,000 have been sold. Plans for 1950 call for ukulele sales nearing the one-half million mark.

To keep up with the indicated popularity of the plastic uke, Mastro hopes to up its production to 2500 finished ukes a day. In order to insure that only perfect instruments get into the hands of the public, each uke is tuned, played, and thoroughly tested before it leaves the factory. Each one is also surface treated and waxed to produce the best possible appearance.—END

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To obtain any of the booklets or catalogs listed below, simply circle the corresponding number on the post card, fill in the information requested, and mail.

PLEXIGLAS FOR OUTDOOR SIGNS

Brochure picturing in color some 30 examples of recent outdoor sign installations and showing a wide variety of colors and lighting treatments achieved with plastic. Properties of the material and ranges of forms, sizes and thicknesses are listed. 20 pages. Rohm & Haas Co. (4-600)

ALKYD COMES OF AGE

Various applications of the new hot-molding compound, Plaskon alkyd, are given along with other detailed information on the material. 4 pages. Plaskon Div., Libbey-Owens-Ford Glass Co. (4-601)

EXTRUDING MACHINES

General specifications of Davis-Standard extruding machines on main drive, feed section, cylinder, stock screw, head equipment, and accessories are given. Also included is tabulated statistical information. 4 pages. The Standard Machinery Co. (4-602)

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Groov-Pins—pins said to require no tapping or reaming, to defy vibration shock, and to reduce assembling time and cost—are illustrated and discussed. Detailed information on types of Groov-Pins is given. Groov-Pin Corp. (4-603)

DECORATIVE LAMINATING RESIN

Brochure containing 10 pages describing the preparation and use of melamine-formaldehyde resin for decorative laminates. Monsanto Chemical Co. (4-604)

ELECTRONIC HEAT-SEALING EQUIPMENT

Photographs and specifications of various generators and presses used in the heat sealing of vinyl film are given on post-card size cards. Kabar Mfg. Corp. (4-605)

ELECTRIC POWER DRIVES

Discussed in this set of bulletins are various Sterling electric power drives. Specifications and prices are also included. 22 pages. Sterling Electric Motors. (4-606)

RESINS

Tabulations giving specifications of Synvar resins for woodworking, textiles and paper fibres, molding compounds, brake lining and grinding wheels, protective coatings, etc. Synvar Corp. (4-607)

THERMOCOUPLE MANUAL

Data book containing descriptions, prices, and recommendations for thermocouples, heat-eyes, lead wire, thermocouple wire, heads, connectors, etc. Essential information and curves for thermocouple selection and applications are also included. 40 pages. Wheelco Instruments Co. (4-608)

FORTIFIED OILS

Discussed in this 4-page illustrated brochure are various fortified oils and packings produced by E. F. Houghton & Co. (4-609)

FLEXIBLE SHAFT MACHINES

Catalog giving detailed information on Kellerflex flexible shaft machines and accessories. Illustrated. 50 pages. Pratt & Whitney Div., Niles-Bement-Pond Co. (4-610)

PHENOLIC FOAM

Technical report on insulation properties, types and forms of phenolic foam, available, and ordering information. 3 pages. Illustrated. General Electric Co. (4-611)

VINYL COMPOUNDS

Technical data on Extruvin injection-molding, calendering, extrusion, and electrical compounds. Available for export distribution only. Omni Products Corp. (4-612)

FURFURAL

An introduction to the chemistry of furfural including structural formulas, nomenclature, furan compound formation, chemical properties, etc. 16 pages. The Quaker Oats Co. (4-613)

VINSOL

Summary of properties of Vinsol, low-cost, dark, rosin resin, and applications such as modifier, extender or partial replacement for phenolics. Hercules Powder Co. (4-614)

ALKATHENE TUBE IN AGRICULTURE

Brochure giving information on the availability, manipulation, properties, etc. of Alkathene tube—a new, light-weight, flexible non-metallic material with exceptional resistance to corrosion and low temperatures—for use in agriculture. 8 pages. Imperial Chemical Industries Ltd. (4-615)

PLASTICS VARIETY

Felsenthal services, methods, and materials are discussed. Descriptions of various plastic raw materials are also included. 24 pages. G. Felsenthal & Sons. (4-616)

CORES AND CAVITIES

Given are instructions for making patterns with the Crain-Ambrose process. Also outlined are advantages of the process. French Williams Co. (4-617)

SELF-SERVICE WITH CELLULOSE ACETATE

4-page folder giving information about packaging fresh fruits and vegetables in Lumarith film. The features of this transparent "breathing" wrap film are presented. Celanese Corp. of America. (4-618)

ORGANIC PEROXIDES

Table describing the various organic peroxides available from Lucidol. Trade names, formulas, assays and active oxygen contents are given. Ludicol Div., Novadel-Agene Corp. (4-619)

PLASTICS MOLDING PRESS

Provided are descriptions and specifications for the new Stokes No. 741 completely-automatic plastics-molding press, together with views of typical plastics parts molded on the press. 4 pages. F. J. Stokes Machine Co. (4-620)

ENGINEERING PROPERTIES OF INCONEL

Engineering data on Inconel—high-strength, heat- and corrosion-resisting alloy. Information on corrosion resistance, working properties, and typical applications in industry. International Nickel Co., Inc. (4-621)

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POLYVINYL ACETATE SOLUTIONS AND EMULSIONS
Two bulletins representing one of the most comprehensive surveys of the industrial application of polymeric and copolymeric vinyl acetates ever offered. American Polymer Corp. (4-623)

POLYTHENE
The forms available, properties, and working techniques of Du Pont polythene are discussed in this 4-page illustrated bulletin. E. I. du Pont de Nemours & Co., Inc. (4-624)

AUTOMATIC ROLL FEED ATTACHMENTS
A single-draw attachment and a three-draw multiple attachment used for announcements, book covers, menus, show cards, etc. are discussed. 4 pages. Hambro Machinery Div. (4-625)

PLASTICS PRODUCTS
Various compression-molded knobs are illustrated, and accompanied by blue prints and descriptions. 8 pages. Rogan Bros. (4-626)

AUTOMATIC DEGATING AND SEPARATING
Four-page booklet and photographs describing a new, economical method of degating and separating multi-cavity injection-molded shots; with data and diagrams. Lindex Corp. (4-627)

INJECTION-MOLDING MACHINE
The Watson-Stillman 2-oz. vertical injection-molding machine is discussed. Specifications, diagrams, and illustrations are included. 4 pages. The Watson-Stillman Co. (4-628)

PROCESSING MACHINERY
The Banbury mixer, mills, and calenders, are described in this 4-page brochure. Illustrations are included. Farrel-Birmingham Co., Inc. (4-629)

SLITTING AND MANGLING MACHINE
Information on the operation and applications of the Cumberland slitting and mangling machine, available with either two or four blades, is given. 4 pages. Illustrated. Cumberland Engineering Co., Inc. (4-630)

THERMOPLASTIC MATERIALS
Lubricated, general-purpose, and high-heat styrenes, cellulose acetate, ethyl cellulose, and adhesives are described, and properties are listed. 8 pages. Koppers Co., Inc. (4-631)

MOLDING AND EXTRUSION
Elementary descriptions of the processes, plus four-color illustrations of numerous products. Company services are described. Technical data includes material selection, tables, charts. 50 pages. Elmer E. Mills Corp. (4-632)

CARBON BLACK
Guide for the correct selection of the carbon black best suited to particular products. 16 pages. Godfrey L. Cabot, Inc. (4-633)

MOLDING PRESSES
Both compression and plunger types are described, with complete technical specifications. 16 pages. The Baldwin Locomotive Works. (4-634)

METALLIC SOAPS
Aluminum, calcium, magnesium, zinc stearate. Description, specifications, and uses. Separate leaflet describes advantages of bag packing. 8 pages. American Cyanamid Co. (4-635)

CIRCULAR AND BAND SAWS
Saws with teeth especially designed for cutting plastics. 4 pages. E. C. Atkins and Co. (4-636)

PELLET-DICER
For manufacturers and processors of thermoplastic materials, literature available includes a four-page illustrated booklet. Ball & Jewel, Inc. (4-637)

EXTRUDED ROD, TUBING AND SHEETING
General descriptive folder on plastic materials and the forms in which they are offered by the company. Contains a comparative properties chart for six common thermoplastic materials. 8 pages. Plax Corp. (4-638)

THE ABC'S OF MODERN PLASTICS
A basic outline of the origin, preparation, and uses of plastics and an evaluation of the influence of these plastics on our modern day living. 35 pages. Bakelite Div., Union Carbide & Carbon Corp. (4-639)

GEON POLYVINYL MATERIALS
Introduces the various types of Geon materials, their compounding, processing, and end-uses. 16 pages. B. F. Goodrich Chemical Co. (4-640)

TENITE INJECTION MOLDING
A complete treatment of the process of injection molding, material selection, product and mold design, and finishing methods. Cross-section drawings of typical molds. 36 pages. Tennessee Eastman Corp. (4-641)

HOT STAMPING MACHINE
Describes a machine for stamping designs, numbers, trademarks on thermoplastic parts. Kingsley Stamping Machine Co. (4-642)

PORTABLE ENGRAVER
Data on a machine for engraving on all types of plastic items, as well as other materials. 4 pages. New Hermes, Inc. (4-643)

STANDARD MOLD BASES
Engineering drawings and specifications on all articles sold and service rendered by Detroit Mold Engineering Co. (4-644)

MOTORS
Handy guide gives specifications on squirrel-cage induction motors, along with application data, range of sizes, etc. 12 pages. Allis-Chalmers Mfg. Co. (4-645)

INJECTION MOLDING MACHINES
Photographs and basic specifications of complete Lester line of injection machines ranging from 4 to 48 oz. in capacity. 4 pages. Lester-Phoenix Inc. (4-646)

HIGH PRESSURE PUMPS
Folder pictures and describes inverted vertical triplex high-pressure pumps and lists dimensions of each. 8 pages. The Aldrich Pump Co. (4-647)

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Pioneering

(*Continued from pp.* 110-111)

fabricators, on the other hand, had modern, well-designed items. And, with all these advantages, vinyl inflatables sold for less than similar items made in rubber.

Thus 1948 was the last stand of rubber in the market which it had once dominated. Vinyl not only took over almost all of rubber's old market, but it went on to open new fields which the rubber manufacturers had never explored.

In 1947 Bilnor entered the sporting goods field with an inflatable chest protector for umpires. In 1948, Bilnor not only brought out a number of new beach items, but introduced an entirely new product: inflatable wading pools, in two sizes (40 and 54 in. in diameter). The following year Bilnor added a 6-ft. diameter pool and two sizes of inflatable boats (56 and 72 in. long). The boats received wide publicity, including a picture on *Life's* cover.

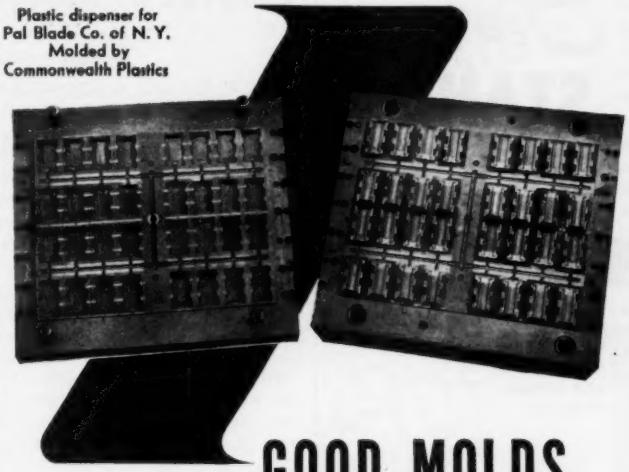
Vinyl Swimming Pools

At the American Toy Fair early in March 1950, Bilnor showed its 1950 line for the first time. Most interesting item in the line is a backyard swimming pool 9 ft. in diameter and 18 in. deep. The pool, like Bilnor's wading pools, is made up of three independently inflated rings of Vinylite film electronically bonded to one another and to a pool bottom made of the same material. Although it is big enough to hold five or six adults (it holds 600 gallons of water), it is being promoted as a place to teach children to swim.

Another item in Bilnor's 1950 line is a 6-ft. diameter water wheel in which a man can stand upright and tumble in the surf much as a squirrel exercises in a squirrel-cage.

With these new items, Bilnor once again takes the lead in expanding the size of the market which was once the bailiwick of rubber and is now a private preserve of vinyl film. And Bilnor's pioneering is paying off. In 1950, this five-year-old company will sell over a million dollars worth of vinyl inflatables—which is more than twice the company's 1949 volume—which was more than twice the 1948 volume—which was more than twice the 1947 volume.—END

Plastic dispenser for Pal Blade Co. of N. Y. Molded by Commonwealth Plastics



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Emerson Story

(*Continued from pp.* 114-116)

One of the most popular models Emerson ever made had a Catalin cabinet and butyrate grille. It was designed by Norman Bel Geddes and brought out in Emerson's 1941 line as "the Patriot" or Model 400. The patriotic theme was carried out in the design of the cabinet by the red-white-and-blue color scheme, the resemblance of the grille to the stripes on a flag, and molded-in stars on the tuning knobs.

Emerson's first thermoplastic cabinet was molded of butyrate and used on the Model 432 in the 1942 line, brought out just before production of radios for the civilian market was halted for the duration. In the first post-war line—in 1946—Emerson introduced its first polystyrene cabinet which was incorporated in the Model 547.

The Model 602 in the 1948 line marked the first appearance of front panels or escutcheons molded of clear polystyrene and sprayed with gold on the rear surface. Such panels were designed into many Emerson 1948 models, including some (like the Models 615 and 616) with wooden cabinets.

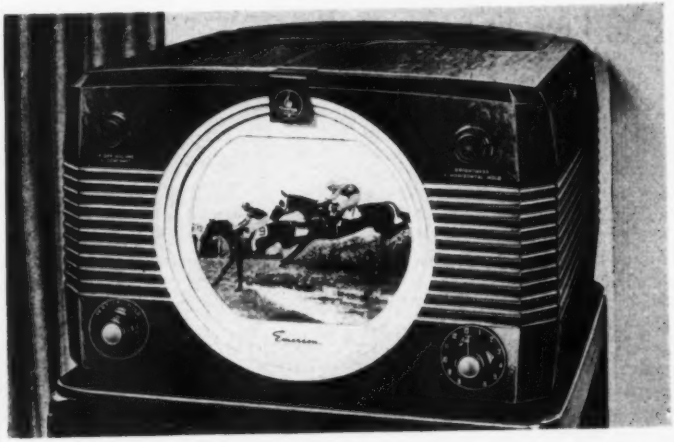
Today, most of Emerson's table models have either phenolic or polystyrene cabinets, and Emerson is actually in the molding business itself by virtue of its ownership of Plastimold Corp., Attleboro, Mass., which it bought in 1946. But one molder cannot supply all the cabinets Emerson needs. In addition to those molded by Plastimold, table model radio cabinets are molded for Emerson by Worcester Moulded Plastics Co., Worcester, Mass., Gemloid Corp., Elmhurst, N. Y., and Tech-Art Plastics Co., Inc., Long Island City, N. Y.

In Television

Emerson is also beginning to use more and more plastics in its television receivers. Numerous internal electrical applications which take advantage of the insulating value of plastics are an indispensable part of all sets. In the Model 600 of the 1947 line, Emerson began to use plastics in major exterior applications. The 600, a 7-in. TV set, had a front molded of clear acrylic by Cruver Mfg. Co., Chicago. Part of the piece was sprayed from the rear and part of it was left clear as a window in front of the screen. The Model 621 had a phenolic front molded by Plastimold.

In the 1949 line, Emerson introduced its first television receiver with a molded cabinet, the Model 614. The cabinet, which is 20 in. wide, 13½ in. high, and 17½ in. deep, is molded by The General Industries Co., Elyria, Ohio. The cabinet is still being used for the Model 614, which is a current model.

Plastic cabinets for television receivers made first appearance in the Emerson line in 1949. Molded of phenolic, the cabinet is used on the Model 614



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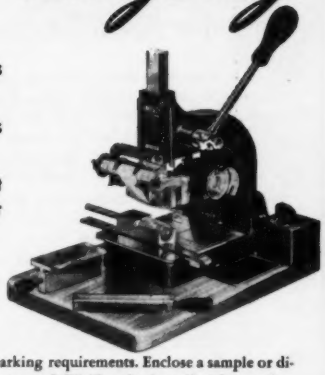

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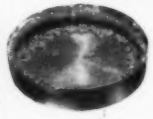

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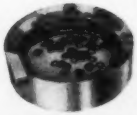

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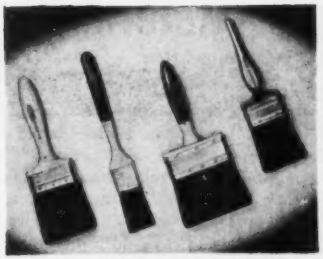

COURTESY E. I. DU PONT DE NEMOURS & CO., INC.

Nylon-bristled brushes are available in many sizes for consumer use

Brushes

(*Continued from p. 120*)

appeal for manufacturers, distributors, and retailers alike. For example, the nylon bristles are the first domestic source of top-quality brushes, which means steady prices and quick supply. Again, the nylon bristles are the first domestic source of top-quality brushes, which means steady prices and quick supply. Further, the nylon bristles don't have to be packed with moth balls or camphor flakes to prevent insects and fungi from eating or spoiling them, which has always been a problem when natural bristles have been involved.

One large manufacturer that has been successfully using the nylon bristles is Rubico Brush Manufacturers, Inc., New York, N. Y. Today, 25% of Rubico's master paint brush production is nylon, which it is making at half the cost of the natural-bristled brushes. In a speech made before the Wholesale Distributors Div. of the National Paint, Varnish, & Lacquer Assoc., Isidor A. Rubin, president of Rubico, had the following to say regarding nylon bristles: "In establishing nylon in our industry, we will be assured of a laboratory-made and tested bristle, with laboratory controlled taper, uniformity, and texture, out of which will be made uniform brushes suitable for the most exacting painting jobs.

Now, with the commercial field pretty well developed and consumer promotion underway, Du Pont expects that within a few years brushes bristled with nylon will command a substantial portion of the total volume.

33 Advantages of Using FERRO Vinyl Stabilizers

Ferro's broad and complete line of vinyl stabilizers makes available combinations to meet *your* production requirements—whether they are for exceptional heat and light stability or maximum clarity and compatability. Ferro stabilizer combinations are available for maximum stabilizing activity in all formulations regardless of resin or plasticizer type used in your formulation. Ferro offers vinyl manufacturers a complete line of stabilizers compounded to every production requirement . . . stabilizers formulated to a new high in technical excellence—from drum to drum—batch to batch. Remember, much of *Ferro's* research has been conducted jointly with some of the largest producers and users of vinyl resins. This experience can be brought to bear on special problems. Write us for samples and product data. Your inquiries will receive prompt attention.

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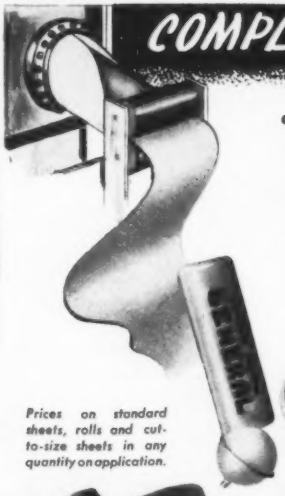

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GENERAL PLASTICS CORPORATION

MARION, INDIANA

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Molding

(*Continued from pp.* 131-134)

their respective costs per thousand is just about equal to the cost of a full-time, experienced operator.

CASE III. A relay cover is now being molded on a transfer press, with a 15-cavity mold, using preforms from a heavy-duty preformer. Production requirements were such that smaller automatic presses did not provide an economic answer, so the transfer press was used. The entire set-up of transfer press, preformer, and preheater cost approximately $12,600, with pro rata allowance made for the preheater to serve two machines and the preformer to serve three. Against this, compare the cost of $6950 for a new-type fully-automatic press which can do the job perfectly, using a mold with the same number of cavities, and with no expense for buying or using a preformer and preheater.

CASE IV. In this case we studied an end-plate for a fishing reel. We were asked to quote on a transfer press, but the size, shape, production rate, and other factors forced us to consider the possibilities inherent in a low-cost automatic press installation. The customer knew all about our earlier and smaller automatic presses but had no inkling of the other potentialities in the newest automatic press.

We prepared a careful estimate of the investment, the mold cost, the hourly production rate, the labor cost per thousand pieces, the percentage of rejects and material loss, and summarized our findings in a recommendation. There was no choice possible from our calculations except the new-type automatic press. That our estimates were reasonably accurate is attested by the fact that two of the recommended presses are now in regular operation, to the complete satisfaction of the customer.

In conclusion, we suggest that every molder give careful study to the all-important factors of investment and operating cost before he signs an order for a press, be it a transfer or compression press, automatic or semi-automatic.

There is no simple formula . . . every situation requires individual, unbiased, objective analysis.

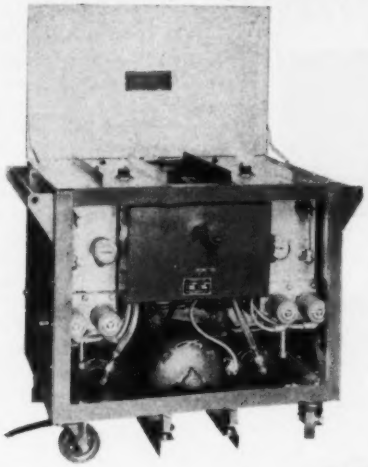
Quality Control through

Temperature Control

is made possible with

THERMOLATOR

(Patents Applied For and Pending)



Rising standards of quality for thermoplastic products make it desirable for you to investigate THERMOLATOR'S advantages and record of performance.

THERMOLATOR is the finest device obtainable to accurately control temperature in either half of the mold, draining or adding heat as desired.

Inquiries Invited

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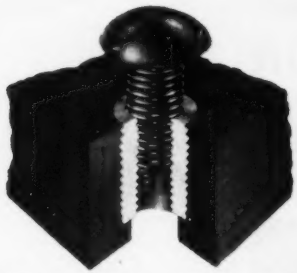

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(Pat.) tap their own threads into all types of plastics, wood and soft metals for increased shearing strength, when screws, bolts, studs, etc. are used under stress loads. Self-tapping segments securely lock inserts and screw fasteners in cored or drilled holes.

TAP-LOK INSERTS Promote Efficiency and Savings

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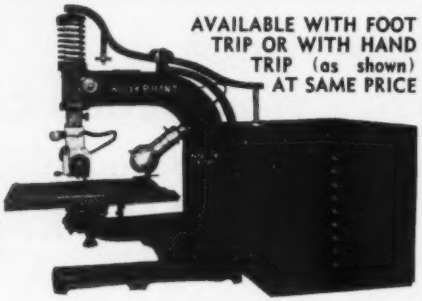

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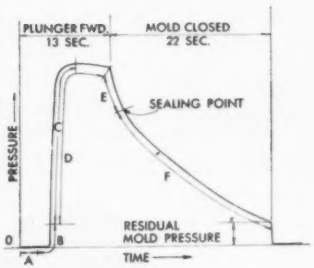
Plastic Molders Since 1920
DIEMOLDING CORPORATION

Injection Molding

(Continued from pp. 143-150)

the plunger forward time was changed. From these pressure cycles, it is evident that no changes were produced in the mold filling time. Pressure build-up on all the cycles is essentially the same. The packing period, however, has been increased with longer plunger forward times, and directly connected with this, is the degree of discharge. With only 5 sec. of plunger time, discharge allowed the pressure to drop to approximately 1000 p.s.i. before the cavity was sealed. This discharge, or sealing pressure, together with the average temperature at this pressure, is all-important, for



11—Mold pressure cycle. A is dead time; B is mold-filling period; C is pressure build-up phase; D is packing period; E, discharge: and F, cooling with gate frozen

it is at this instant that the gate freezes. The eventual mold shrinkage, sink marks, and release behavior are determined by this sealing pressure and temperature.

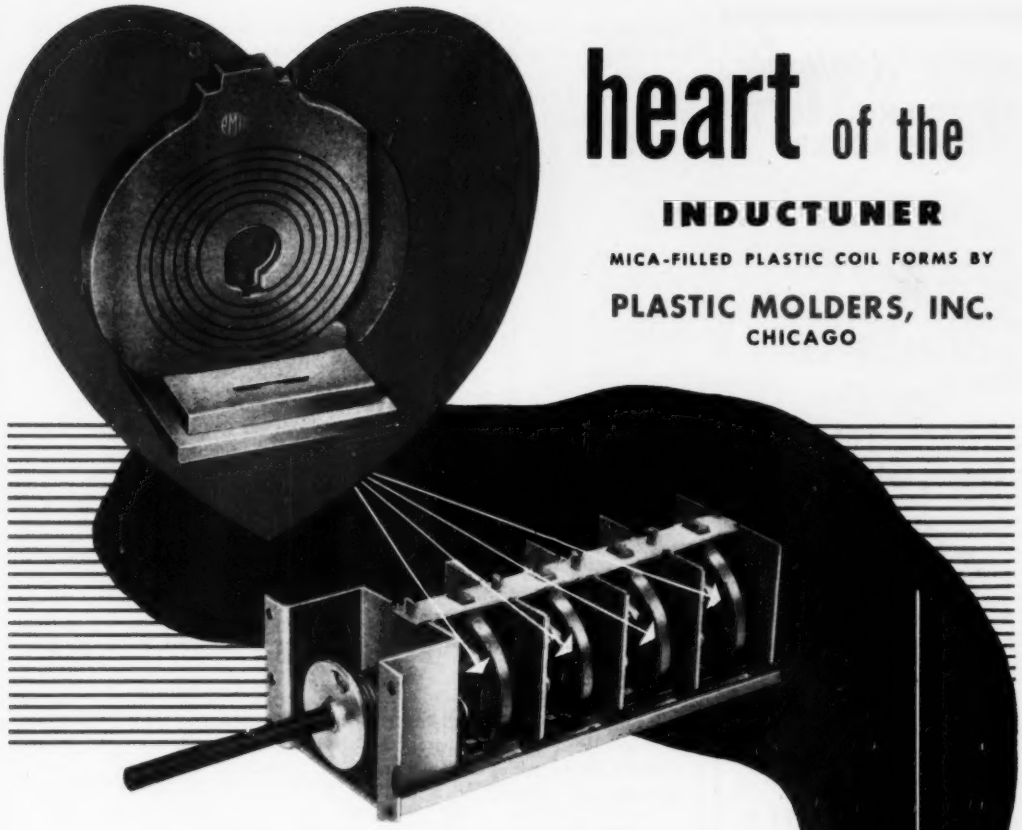
It is also of interest to note that with 5-sec. plunger time, the pressure in the mold reached zero in 7 sec., while at 13 sec. of plunger time, zero pressure required 28 seconds. With 17 sec., the residual mold pressure would never reach zero but approaches 2000 p.s.i. as a limit. If the plunger time had been extended beyond 17 sec., the pressure cycle would eventually have become unchanged by the plunger time, as indicated by the broken line. In such a case, no discharge occurs, but the gate freezes off with flow still in

heart of the

INDUCTUNER

MICA-FILLED PLASTIC COIL FORMS BY

PLASTIC MOLDERS, INC.
CHICAGO



Excellent tuning selectivity of many television sets is due principally to the new Mallory inductuner. Manufacture of this inductuner calls for *precision* plastic parts.

The high dielectric plastic spiral coil forms that hold the silver wire coils are produced by PLASTIC MOLDERS, INC. (CHICAGO) through careful skill that has established such a fine reputation among hundreds of electronic parts users.

This coil form is molded of mica-filled phenolic for ultra high frequency use, and must be held to very close tolerances. The multiple cavity mold being used was engineered, designed and produced also by Plastic Molders, Inc. (Chicago).

No matter what your special requirements may be in plastic parts, we invite you to take advantage of the *engineering* and *production* skill that awaits you here at Plastic Molders, Inc. Contact us on your next compression or injection molding job and learn about economies made possible through our improved production methods.

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Ideal for frozen food packaging because it is non-toxic and stays tough and strong at sub-zero temperatures. Hundreds of other uses.

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Consult us on your film problems without obligation. Write for samples and prices. Ask about the new SURCOLENE in colors!

Made by the manufacturers of Surco Plastic Binding and Welting.

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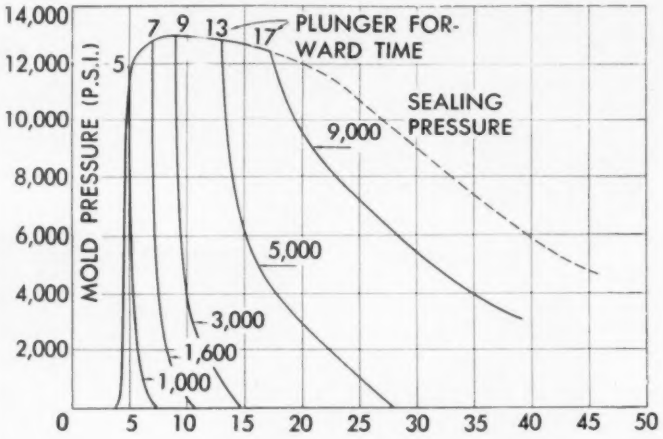
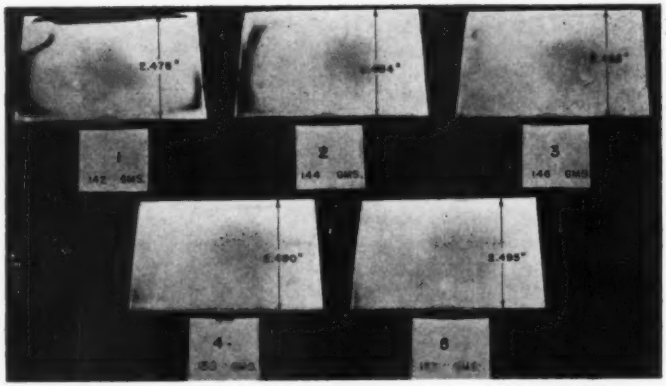
199 Washington St., Boston 8, Mass.

the direction of the cavity. Residual pressure, in this case, might be high enough to prevent opening the mold, as has been the case at other operating conditions.



12—Mold pressure curves of a 6-oz. shot in a 12-oz. machine on a 60-sec. cycle at injection temperature of 490°F. and a pressure of 16,000 p.s.i.

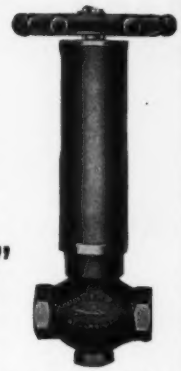
One surface of each of the moldings produced in these pressure cycles is shown in Fig. 13. They are numbered in order, from 5 to 17 sec. plunger time. Note that No. 1 has a considerable amount of sink; No. 2 has a lesser amount; and in Nos. 3, 4, and 5, there are practically no sink marks. The weight of each molding is shown, and they increase from 142 to 153 grams. Density measurements have shown that such an increase is not due to density changes. Mold shrinkage has also decreased, as shown by the dimensions for the height of each box. Referring to Fig. 12, note that the sealing pressure against mold shrinkage, as in Fig. 14, shows the dependency of mold shrinkage on the sealing pressure. It is quite



13—One surface of each of moldings produced in pressure cycles shown in Fig. 12. Sink marks are plain in Nos. 1 and 2; almost vanish in 3, 4, and 5

The best way to reduce high pressures —

500 lb. per. sq. in.
1,000 " " " "
2,000 " " " "
3,000 " " " "
4,000 " " " "
5,000 " " " "
6,000 " " " "



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ATLAS Type "E"
High Pressure Reducing Valve

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For other ATLAS plastics plant products see the partial list in our ad in the January 1950 issue of MODERN PLASTICS

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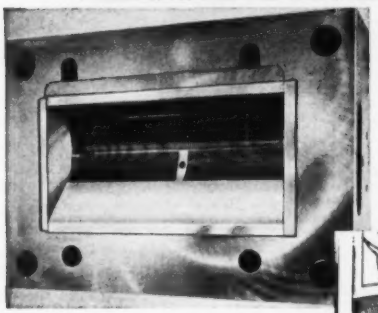

Mold made by Newark Die; designed and molded by Sameric Eng'g. Co. for Pottsville Plastics Co.

2-piece interlocking ventilator adjustable to 36 inches.

BUT a clean breeze from this window ventilator, molded of polystyrene. Note how each rib had to be accurate to thousandths. Here's mold making by Newark Die Company that reflects the craftsmanship developed during 30 years of building molds for the plastic industry. We can solve any multiple-cavity-mold problem you've got.

Send for our free booklet, "The Procedure of Die Hobbing"

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Courtesy of Ideal Models Co., Detroit, Michigan

for Model Kitchens!

Here's how Ideal Models Co. of Detroit saves with six versatile De-Sta-Co Toggle Clamps in a simple, economical, plastics cementing fixture. The turntable fixture more than *doubles* production . . . eliminates a most serious bottleneck, the slow cementing cycle.

These models are produced for a large manufacturer of metal kitchens. Designed for sales promotional purposes, each must be a perfect reproduction. This operation, cementing tops on the models, requires: Fast cementing cycle—positive clamping pressure for a perfect bond—precise alignment for accurate assembly.

De-Sta-Co No. 225-U fills these requirements for Ideal. Completely retractable when opened for quick insertion and removal of work, No. 225-U also offers the outstanding features of rapid toggle action, positive holding pressure and unfailingly accurate performance that make De-Sta-Co Toggle Clamps *ideal* "Model Tooling."

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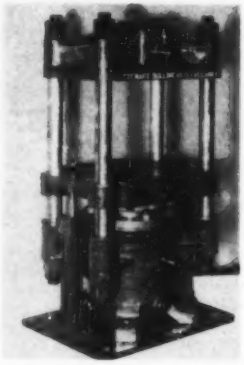

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compression or
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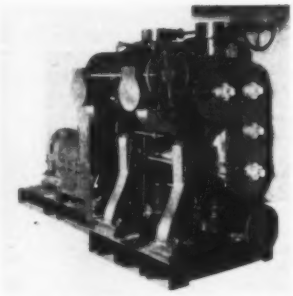

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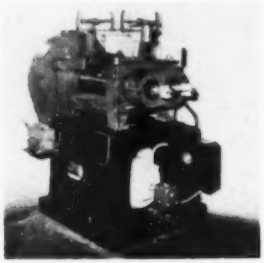
up to 24" x 68" 4 Roll



PLASTIC MILL
8" x 16" Rolls
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from 7" to 84" Rolls

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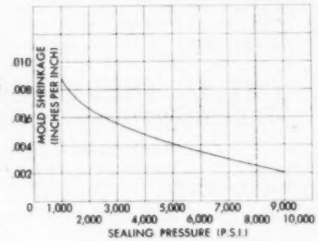
evident that the plunger forward time, at any given set of operating conditions, controls the pressure and temperature at which the molding begins to form under what might be called "its own power".

Another important function of the plunger time, at any one set of operating conditions, is its control over release. If we define release behavior as "the ease with which a molding ejects from a mold which has sufficient draft and no reverse draft", the release behavior at the instant of opening the mold is dependent upon the residual mold pressure. This may be shown by a plot of the residual mold pressure and the force required to open the mold, as in Fig. 15. The force required to open the mold was



14—Curve indicates dependency of mold shrinkage on sealing pressure and influence of plunger forward time under operating conditions which prevailed in Fig. 12

measured by the pressure build-up in the link cylinder. Since this force is directly proportional to the residual mold pressure over a considerable range, we may regard this force as a frictional force arising from the friction between the plastic and the cavity surfaces. The residual mold pressure may then be considered the normal force holding the two surfaces in contact. The higher the residual mold pressure, the more difficult it is to open the mold, and the greater the tendency to score at the surface of the molding, or actually to break, if the molded piece is relatively thin.

In Fig. 16 are shown several mold pressure cycles for the purpose of illustrating the control that the plunger time has over the residual mold pressure. With a plunger time

MASTRO CLOTHESPINS

prove that plastics

3½" Standard
(Actual size)

Clip For Wire
Hanger. 2⅛" long.

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(U. S. Pat. 2,307,239)

New anhydrous aluminum silicate type pigment with cream-white color. Reinforcing agent and filler in synthetic resin and synthetic rubber compounds. Yields excellent processing characteristics and high insulation resistance values in vinyl electrical compounds. Permits excellent mold release in thermosetting compounds.

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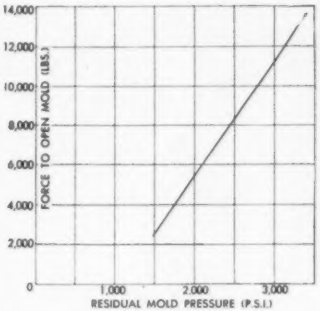
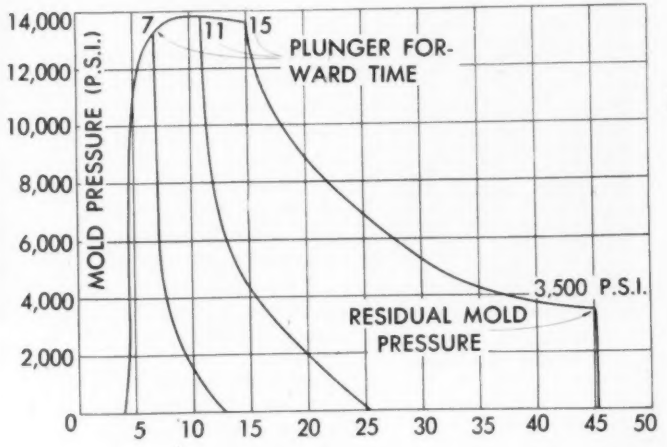
of 7 or 11 sec., the pressure in the mold reached zero before the mold was opened. The plunger time of 15 sec. resulted in a residual pressure of 3500 p.s.i. Note that increased mold closed time would not have lowered this pressure appreciably. In this case, only a shorter plunger time would lower the residual mold pressure. In Fig. 17, the moldings produced from these pressure cycles are shown. They number in order from 7 to 15 sec. plunger time. Nos. 1 and 5 show no scoring, but No. 7 is scored appreciably near the edge and at the point of measuring pressure. The surface where the pressure was measued has a 1° draft, while the rest of the surface has a 2° draft.



15—Plot showing how release behavior at instant of opening depends on residual mold pressure

Thus far, we have discussed only the release behavior as the mold opens, but of equal importance is release from the core. As the mold pressure reaches zero, optimum release can be obtained from either cavity or core. However, if at this instant, the molding has a relatively high average temperature, considerable shrinkage can still take place. With this shrinkage and with the mold still closed, pressure builds up between the molding and the core. If this pressure is allowed to build up appreciably, then scoring or cracking is likely to occur, since it will require a correspondingly higher force to strip the molding from the core. Thus, when molding around a core, three conditions can exist, depending on the plunger time and the mold closed time: 1) One plunger time will allow the pressure to just drop to zero, giving optimum release at any mold closed time after zero pressure is reached; 2) A longer plunger time will prevent a decrease in mold pressure to zero, and, therefore, will likely cause scoring. 3) A shorter plunger



16—Several mold pressure cycles at injection temperatures of 465°F., a machine pressure of 20,000 p.s.i., and operating conditions of Fig. 14 prevailing. Curves illustrate control that plunger time exerts over residual mold pressure

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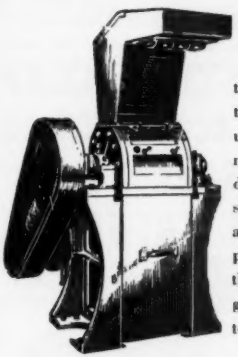

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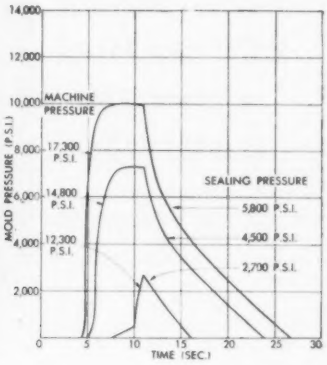
time will allow a decrease in mold pressure to zero where optimum release can be obtained, but on further cooling, will allow pressure to build up on the core. This may cause breaking or scoring at the time of ejection.

for various machine pressures under one set of operating conditions may help in understanding why some results are produced. Figure 18 shows such a set of pressure cycles for machine pressures of 12,300, 14,800, and 17,300 p.s.i. With these increases

sure has increased only 3100 p.s.i. If this piece had been rigid enough to remove after 18 sec., release

17—Moldings produced from pressure cycles of Fig. 16. Nos. 1 and 5 showed no scoring. No. 7 scored appreciably near edge and measuring point



18—Role of machine pressure on mold pressure cycles at injection temperature of 450°F., with 6-oz. shot, 12-oz. unit, 60-sec. cycle

Another important control on the molding machine is the machine pressure. The results that this control produces are often perplexing. A look at the mold pressure cycles

in machine pressure, the filling time has decreased from 10 sec. to 4.7 seconds. Even though the total change in machine pressure has been 5000 p.s.i., the sealing pres-

would have been no problem for a machine pressure of 12,300 p.s.i., but it may have given trouble at

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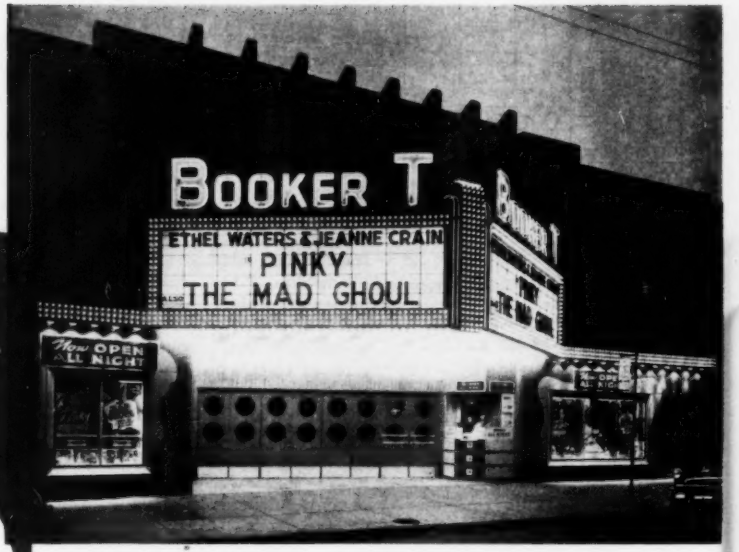
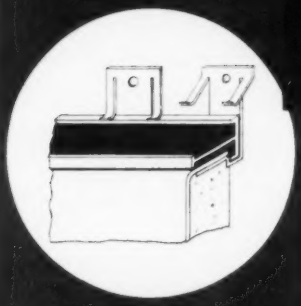


ARCHITECT: TED ROGVOY CONTRACTOR: MARTIN HOFFMAN CO.



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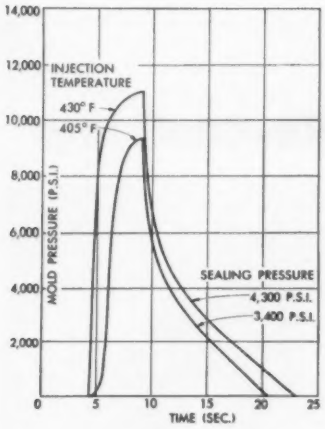


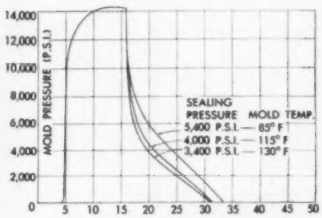
19—Effect of changing injection temperature with same set of operating conditions as in Fig. 18; machine pressure of 18,000 p.s.i.

14,800 or 17,300 p.s.i. because of the high residual mold pressure. In order to obtain good release, the cycle would have to be increased to such an extent that it would be more than 20 seconds.

Figure 19 shows the effect of changing the injection temperature at one set of operating conditions. With an increase in temperature of 25° F., the fill time decreases a little more than 1 sec. and the sealing pressure increases nearly 1000 p.s.i. Such an increase is nearly as much as was produced when the machine pressure underwent an increase of 2500 p.s.i.

Mold temperature also plays an important part in the formation of the molding, as seen in Fig. 20. Increasing the mold temperature from 85 to 130° F. decreases the sealing pressure from 5400 to 3400 p.s.i. Here is one advantage of running the mold as cold as possible. For, the higher the sealing pressure, the less mold shrinkage and the less sink marks. However, for other reasons, such as surface marks, the higher mold temperature may be desirable. In this case, assuming a sealing pressure of 5400 p.s.i. is required to reduce sink marks, a cycle longer by 5 to 6 sec. would be required to obtain optimum release.

While many of the results observed in this work have been known for some time, the explanations for these results have been more or less speculation. With these mold pressure measurements, a few of the effects produced by the various machine controls are more easily understood.—END



20—Influence of mold temperature on mold pressure cycle. Operating conditions same as in Fig. 19; injection temperature, 498° F.; machine pressure, 20,000 p.s.i.

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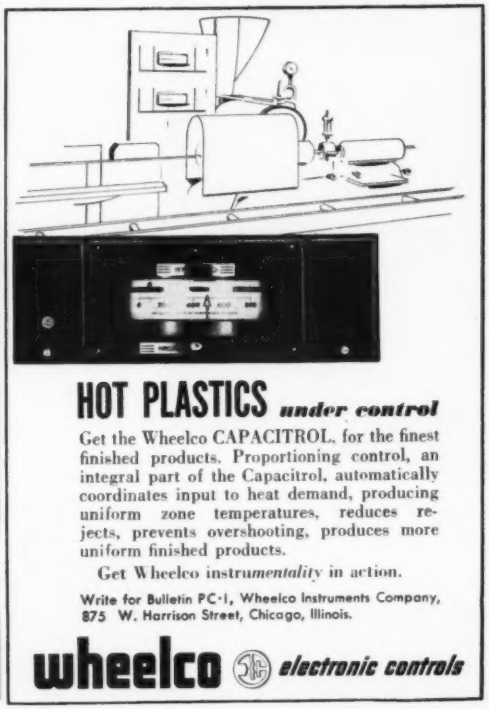
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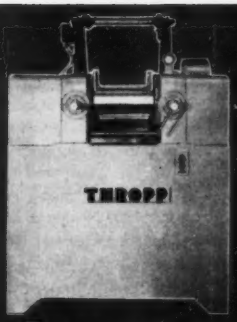

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THE PLASTISCOPE*

NEWS AND INTERPRETATIONS OF THE NEWS

By R. L. Van Boskirk

Colorant for Molding Powder

A NEW line of standard and special colors for use in injection molding and extrustion processing has been announced by Krieger Color & Chemical Co., Inc., 6531 Santa Monica Blvd., Los Angeles 38, Calif.

The company has both opaque and transparent colors, including the complete range set up by the Bureau of Standards plus many metallic and special colors. Called Poly Supra Colors, one lb. of the opaque color will process an average of 450 lb. of crystal polystyrene, according to the producer. In transparent colors, one lb. of color will process 2500 lb. or more of crystal material.

There are now available more than 50 opaque and transparent Poly Supra Colors with additional shades and colors constantly being developed. All are applicable to the processing or reprocessing of polystyrene, acetate, butyrate, or acrylic molding powders.

Krieger recommends tumbling for the coloring process and builds a special fiber drum to accommodate 100-lb. lots. However, colors are sold in from 1-lb. to 250-lb. quantites. In drum mixing, no contamination problem is presented. There are no pre-weighed packages, but Krieger recommends certain proportions geared to the particular color problem. The company claims that its coloring material neither increases nor decreases the cycle time of the molding material. Standard mixing time is one half hour.

Lubricated Polystyrene

FULL-SCALE commercial production of externally lubricated polystyrene has been announced by Koppers Co., Inc., making all three types of the company's polystyrene (3, 7, and 8) now available with external lubrication. The new formulations, called Koppers Polystyrene 31, 71, and 81, will be stocked in standard colors.

Tests indicate that the easier flow of the lubricated polystyrene will make possible a 10 to 30% faster molding cycle, the use of lower molding temperatures, and lower molding pressures. Low bulk factor results in greater utilization of the rated cylinder capacity of the molding machine; excellent mold release of the lubricated material in most cases eliminates the necessity of lubricating the mold, according to the manufacturer.

Plastics Exports

A ROUGH estimate of plastics exports for the year 1949 is given below. The figures do not include material used for camera and moving picture film, nitrocellulose scrap, or finished high pressure laminates but do include vulcanized fiber.

Exclusive of Canada, which was the leading importer of practically all materials from the U. S., the leading polystyrene importers for 1949 were Italy and Brazil, each with an import poundage in the neighborhood of three million. India was operating at the heaviest rate during the late spring months when she imported around 1,400,000 lb., but imports fell away to a very low volume after July. France and Belgium were next in order with totals near two million lb., for the year and it is interesting to note that Hong Kong imported over 1,500,000 pounds.

Total Plastics Exports—1949

January	10,000,000
February	10,500,000
March	12,000,000
April	10,000,000
May	10,500,000
June	10,000,000
July	9,000,000
August	8,500,000
September	9,500,000
October	10,000,000
November	9,000,000
December*	8,500,000
	117,500,000

* The month of December was estimated from an average of the other 11 months.

The leading importer of vinyl chloride and copolymer resins was Italy with well over three million pounds. The next two greatest consumers of American vinyl were Germany with around two million lb. and France with the same. It is also interesting to note that Hong Kong, Brazil, and the Philippine Islands were also comparatively large scale importers of vinyl chloride, each with totals in or near the million-pound class.

Polystyrene was the biggest plastic export from the United States with a total of nearly 30 million pounds. Vinyl and copolymer resins were next with somewhere near 26 million. It is interesting to note that almost seven million lb. of vulcanized fiber were exported in 1949.

Service Charge

SMALL orders and short production runs on custom molded and extruded parts incur extreme costs. With the intention of relieving this situation, General Electric Co. has announced the establishment of a service charge of $35.00 for orders of less than $1000.

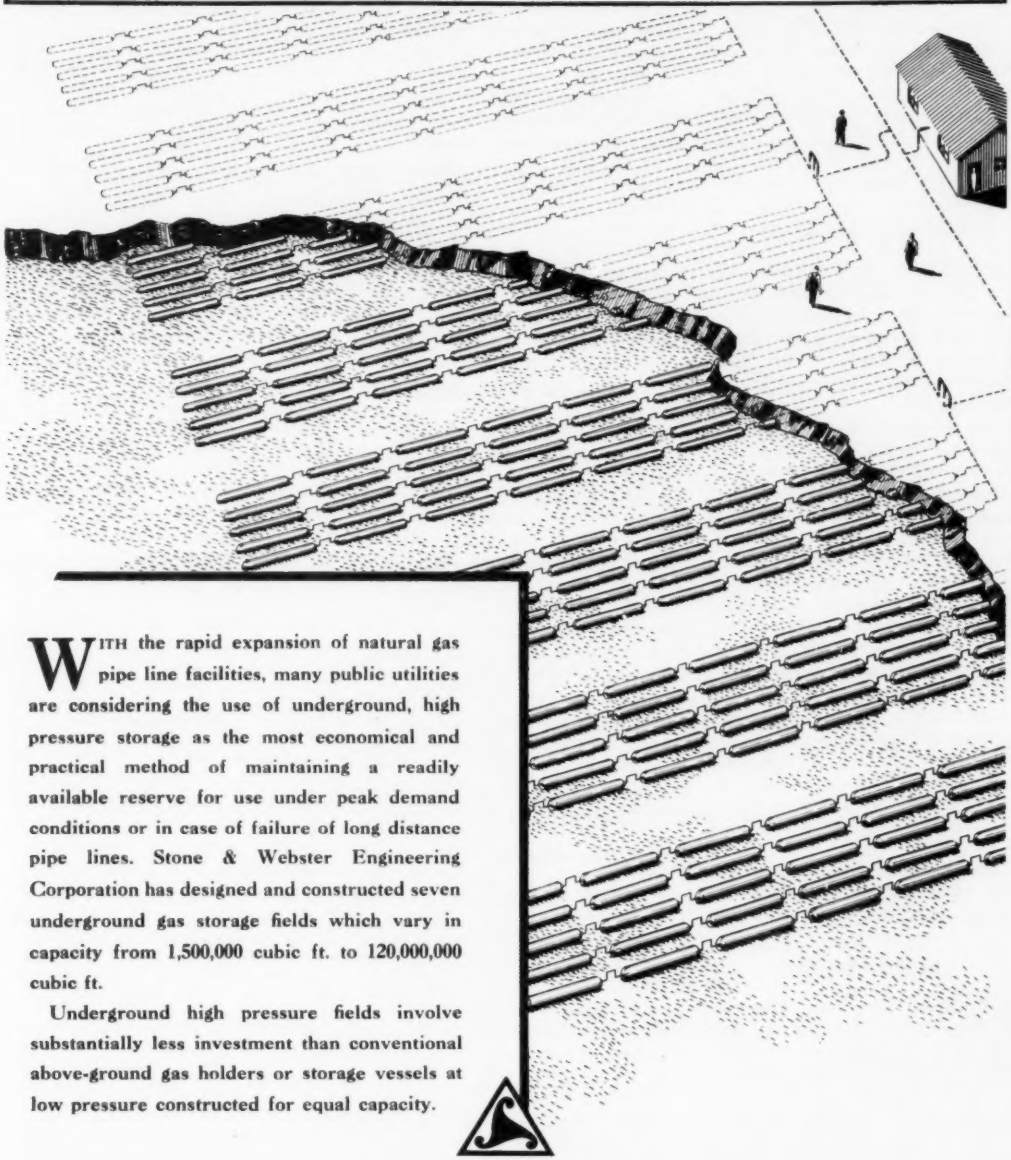
Improved Plasticizers

THE improvement in plasticizers for vinyls which has been going on at a rapid rate for the last two years has been emphasized in the announcement by B. F. Goodrich Chemical Co. of its dioctyl phthalate plasticizer, Goodrite GP 261. This new plasticizer is claimed to be odor free, to have a low acid number, and to be crystal clear in color.

Technologists have striven to eliminate odor from plasticizers for years. Accordingly, Goodrich is quite proud of its achievement. However, users are cautiously warned that the use of GP 261 will not result in total elimination of odor in finished products, but that the odor level will be markedly re-

*Reg. U. S. Pat. Office

From Nature's Gas Wells to Man Made Storage



WITH the rapid expansion of natural gas pipe line facilities, many public utilities are considering the use of underground, high pressure storage as the most economical and practical method of maintaining a readily available reserve for use under peak demand conditions or in case of failure of long distance pipe lines. Stone & Webster Engineering Corporation has designed and constructed seven underground gas storage fields which vary in capacity from 1,500,000 cubic ft. to 120,000,000 cubic ft.

Underground high pressure fields involve substantially less investment than conventional above-ground gas holders or storage vessels at low pressure constructed for equal capacity.

STONE & WEBSTER ENGINEERING CORPORATION

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PLASTISCOPE

duced. Other compounding ingredients often affect the odor of finished plastic products.

The company further points out that its new plasticizer has a water white color rating under 100 and that its reduced acid number—under 0.05—should indicate its good stability coupled with freedom from volatile substances.

Embossing Bed Boards

IMPROVED methods for embossing vinyl and similar plastics sheeting has been made possible with a new type of embossing bed board, according to Rogers Corp., Manchester, Conn., developer of the new material.

The company states that only two hours are required to make an embossing bed out of Rogers board as compared with eight hours for conventional beds when binders board type material is used. Three thicknesses of Rogers board are placed on a cold press, covered with one or two thicknesses of hard kraft paper, and the lay-up is steam treated. After the press is closed, full pressure is maintained for about 1 or 1½ hours. The resultant board is firm, embossed to full depth, will not change its dimensions, and is actually molded to the right level for embossing. It eliminates the need for building up uneven thicknesses in other types of embossing board.

Because of its dimensional stability, the Rogers board will not shrink, pull apart, or delaminate.

Colloid Chemistry

A THREE-week special course in the colloid chemistry of elastomers, to be held from June 26 to July 14, will be a major feature of the 1950 Summer Session at the Massachusetts Institute of Technology, it has been announced by Professor Walter H. Gale, director of the summer session activities.

Designed primarily for engineers and scientists from the rubber and plastics industries, the course will be given by Dr. Ernst A. Hauser, professor of colloid chemistry in the Institute's department of chemical engineering and a leading authority in the field.

Tuition for the three-week course will be $90. Academic credit will be given for satisfactory completion of the course to those who elect to take a final examination.

Letters of application, stating whether or not academic credit is desired, and briefly indicating educational background and professional experience, should be addressed to Prof. Gale, Room 3-107, M.I.T., Cambridge, Mass.

Silicone Mold Release

DEVELOPMENT of a silicone mold release emulsion, called G-E 81161, for use on molds for rubber tires, soles and heels, rubber and vinyl floor tiling, and plastics has just been announced by General Electric Co. This emulsion is diluted and used as a spray on the molds to prevent the molded part from sticking to the mold. The emulsion will resist temperatures as high as 250° C. and does not decompose to produce gases, tarry residue, or build-up. Thus, it helps eliminate gas pockets which so often cause rejects. The new product also eliminates the danger of discoloring light-colored molded parts.

High Temperature, Low Pressure

LATEST development in low pressure high temperature process heating by Livingstone Engineering Co., 100 Grove St., Worcester 5, Mass., is its Speedytherm boiler. This new boiler utilizes the electrode principle of heating—but, instead of using water to produce steam, a special heat transfer liquid is employed. Known as "Speedytherm Liquid," its boiling point is much higher than that of water and its steam or vapor temperature, at any given pressure, is far above that of saturated steam. Speedytherm steam can be delivered and circulated through ordinary piping, making it a suitable medium for platens, molds, jacketed kettles, and autoclaves, where working pressures must be limited and where desired temperatures are in the range from 400 to 550° F.

Ink for Acetate

DEVELOPMENT of a new letterpress acetate ink which permits plate polishing of printed acetate sheets has been announced as a joint development of Celanese Corp. of America and Interchemical Corp.

Producers say that this ink will not lift during polishing, thus eliminating the necessity of laminating a thin film over the printed sheet. Price markers, calendar cards, pocket rules, and packaging are some of the products affected.

The new ink was developed especially for the new Celanese acetate sheeting which is lower in cost than the old-style acetate sheet; and the company announces that special printing types of this white nonflammable acetate are carried in stock. The ink and acetate sheet are suitable for use on job, flatbed, or cylinder letterpresses, and drying can be accomplished with any conventional method. The ink is priced in the same range as other inks used for vinyl, Celluloid, and other plastics materials.

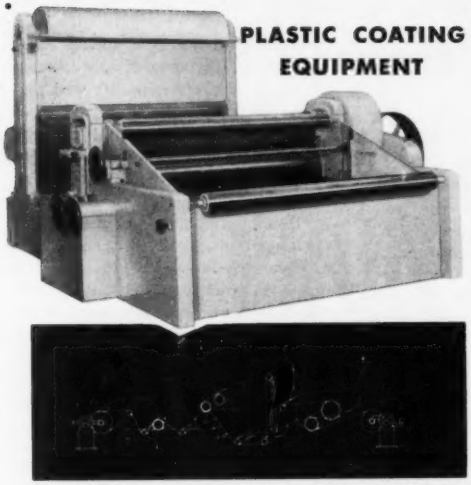
Heart Fund

CHAIRMAN of the New York Committee of the Rubber and Plastics Div. for the Heart Fund, Herman Muehlstein, president of H. Muehlstein & Co., urges full cooperation of the entire industry. Contributions should be mailed to Mr. Muehlstein at his office, 122 East 42nd St., New York 17, N. Y.

Corrosion Protection

ANOTHER variety of industrial tape developed particularly for electrical and chemical resistance has been announced by Bauer & Black, 222 W. Adams St., Chicago, Ill., as one of its line of Polyken tapes.

It is particularly interesting to the trade because it is developed by the company's new process of "calender-orienting" and is essentially an oriented polyethylene film with a



PLASTIC COATING EQUIPMENT

FOR WAXES — RESINS — EMULSIONS — LACQUERS — HOT MELTS, ETC.

Submit your requirements, or problems, in the field of conversion to Dilts. If you have something new or original in mind, let Dilts engineer it into reality.

ADLER SYSTEM EQUIPMENT
PRODUCT OF DILTS

DILTS MACHINE WORKS
DIV. OF THE BLACK-CLAWSON CO.
FULTON, N. Y.

Exquisite Beauty
GITS CRYSTAL SEAL

Crystal SEAL

The most beautiful thing in plastic. Crystal Seal is the Gits Process of 3-dimensional art embedded in transparent plastic that is so widely used for emblems and decorations in the automotive field. Also ideal for medallions, stationery, name plates, desk products, signs, knobs, etc. Qualified molders are licensed under Patent No. 2,354,857.

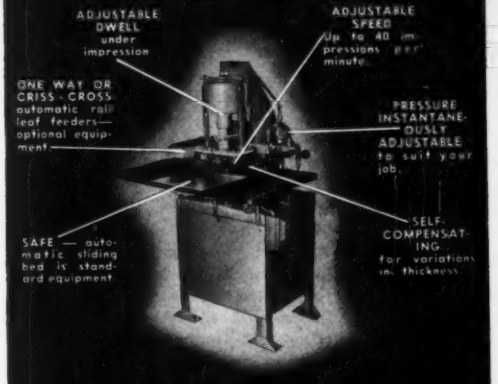
Ageless Utility
GITS MULTIPLE SHOT

The most lasting thing in plastic — and attractive too! Multiple Shot is the Gits Process wherein two or more separate plastics are individually or integrally inter-molded to give either a raised or an inlaid effect that will last a lifetime. Ideally suited to such as counter wheels, business machine keys, etc. Qualified molders are licensed under patents Nos. 2,285,963-2,288,187 - 2,298,364 and 2,298,365.

See them both in BOOTH 159 NAT'L PLASTICS EXPOSITION March 28-31 incl. Navy Pier Chicago

GITS
Molding Corporation
4614 WEST HURON ST., CHICAGO 44, ILLINOIS
Manufacturers of the Famous Gits Flashlights, Knives, Savings Banks, Protect-O-Shields, etc.

THE NEW UNIVERSAL STAMPOMATIC
for efficient color embossing and inlaying of all plastics


ADJUSTABLE DWELL under impression
ADJUSTABLE SPEED Up to 40 impressions per minute
ONE WAY OR CRISS-CROSS automatic roll leaf feeders—optional equipment
PRESSURE INSTANTANEOUSLY ADJUSTABLE to suit your job.
SAFE — automatic sliding bed is standard equipment
SELF-COMPENSATING for variations in thickness.

Because it operates by compressed air power, it delivers a "cushioned impression" that eliminates breakage of the items being stamped.

Tell us which plastic materials you desire to mark. We'll rush samples of UNIVERSAL STAMPOMATIC color embossing for your inspection. Write at once.

Manufactured by: PRINTING INDUSTRIES EQUIPMENT, INC., N. Y.
Sole Distributors: HAMBRO MACHINERY DIVISION
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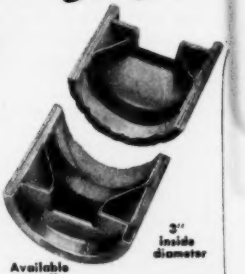
for Plastic Sheeting & Film

The JOANNA METAL END CORE



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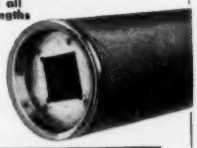

CRUSH RESISTANT TO 7,500 lbs.

PRODUCTION METAL PRODUCTS CO.
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PLASTISCOPE

synthetic adhesive applied to one side. It maintains a permanent pressure around coated metal equal to the tension used in applying it: this pressure prevents the flow of moisture between the tape and the protected metal.

The tapes are 0.009 in. thick (0.007 in. of polyethylene, 0.002 in. of adhesive) and come in widths of 1½ or 3 inches. Inquiries should be addressed to the company's distributor, Plastic Engineering & Sales Corp., P. O. Box 1037, Fort Worth, Texas.

Anti-Static

TO eliminate charged surfaces which pick up cigarette ashes, lint, dust, and so forth, the Merix Chemical Co., 1021 E. 55th St., Chicago, Ill., is marketing two new antistatic compounds. Said to make plastic surfaces static-free, No. 79 is wiped, sprayed, or brushed on smooth areas. No. 79-OL is primarily used on textiles and plastic fabrics, either in the compound, wiped onto finished products such as automobile seatcovers, or sprayed on carpets or rugs.

Both compounds are non-flammable, fairly fast drying, and practically invisible when dry, according to the manufacturer.

Polystyrene Glass Mat

COMMERCIAL production of polystyrene-impregnated Fiberglas mat has been announced by the Plastics Div. of Fabricon Products, Inc., River Rouge, Mich. Called Phenopreg grade DP-490, the material is available in sheet form in natural color but will soon be made in a variety of colors.

Latex Plant Destroyed

PRODUCTION of its styrene-butadiene latices—temporarily cut off when its plant at Midland, Mich. recently burned down—will be resumed as early as possible, according to a Dow Chemical Co. spokesman. The Midland plant was destroyed by fire on Feb. 16 with a loss of 8 workers and 26 injured. The company stated that the fire involved raw materials within the plant rather than finished latex which is a water suspended resin and not considered a fire hazard. The accident had no effect upon the company's production of styrene monomer or polystyrene.

The styrene-butadiene latex manufactured in the destroyed plant is a material that has made rapid progress for use in surface coatings and to some extent in paper treatment. The plant had been in production for the last three years. So successful has the product been that the company had already made plans for expanded latex production in new plants to be located in other parts of the country, but has made no statement as to how soon these new plants will be prepared to commence operations.

New Decals

DECALS made especially for cellulose acetate have been announced by the Midwest Decalcomania Co., 525 W. 76th St., Chicago, Ill. Company spokesmen state that the new decals are unaffected by plasticizer and, consequently, will not become soft or tacky. When tested on cellulose acetate for 72 hr. at 100° F. temperature and 100% relative humidity, they show no deteriorating. The decals are applied in a regular water-dip slide-off manner, and have good bonding qualities.

Du Pont Film Division

A NEW division to be known as the Film Dept. has been created by E. I. du Pont de Nemours & Co., Inc.

The company states that this step was taken because the business of the Cellophane Div. has expanded to such an extent since the war as to justify the organization of a separate department. The new department, which has no connection with the company's photo products department, will manufacture not only cellophane film, but also cellulose acetate film, polythene film, cellulose sponges and sponge yarn, and Cel-O-Seal cellulose bands. It is an entirely separate and distinct division from the Polychemicals Div. which was recently formed from a combination of the Plastics and Ammonia Div. which is supervised by Robert Ries.

Donald E. Carpenter, the general manager of the Film Dept., is a native of Wilkes Barre, Pa., and first went to work for Du Pont in 1922. He has been vice president of the Remington Arms Co., has been Deputy to the Secretary of Defense on Atomic Energy, and was recently Chairman of the Munitions Board. Arlington Kunsman, assistant to Mr. Carpenter, is a native of Flicksville, Pa., and joined Du Pont in 1916. He has been Director of Production of the Rayon Div. and in 1948 was designated as manager of the Cellophane Div.

Patents

BOOKLET entitled "Available Patents, Plastics Products and Processes" has been published by the Commerce Department and is available from the Superintendent of Documents, U. S. Govt. Printing Office, Washington, D. C., or from any Dept. of Commerce Field Office, at 25 cents a copy. The 76-page booklet provides ideas for plastics products in some 21 product fields. Items listed are taken from patents available for licensing or sale.

Correction

AN item in February Plasticope mentioned that Reichhold Chemicals, Inc., Detroit, had purchased the American Alkyd Industries plant at Carlstadt, N. J. The item should have read that Reichhold purchased that company's Canadian plant in Toronto. The plant at Carlstadt is still owned and operated by the American Alkyd Industries.

FINANCIAL NEWS

Hercules Powder Co. reports net income of $9,951,960 for 1949 in comparison to $10,947,062 in 1948. Sales in 1949 were $121,000,000 in comparison to $129,000,000 in 1948.

(*Continued on p. 236*)

"designed right—in the right plastic"

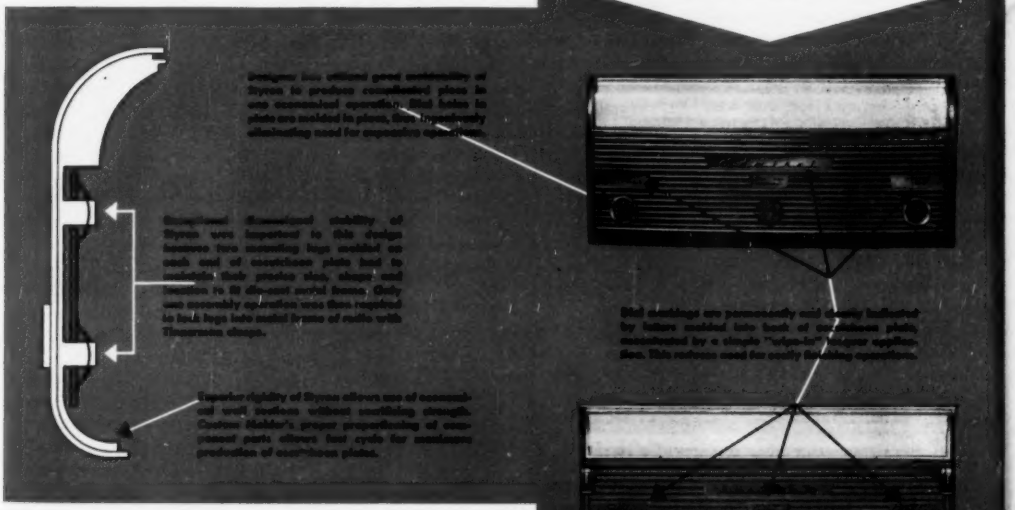
CUSTOM MOLDERS' KNOW-HOW plus

STYRON

solves another production problem!

ANOTHER CUSTOM MOLDING CASE HISTORY

Styron 666 was specified by the Custom Molder for the escutcheon plate on the Admiral Radio. Its selection was based on its excellent clarity . . . lower material cost and ease of molding which virtually eliminated machining and finishing operations for this attractive piece.



Molded by Victory Manufacturing Company, 1722-1724 West Arcade Place, Chicago 12, Illinois, for Admiral Radio Company

Skilled in solving difficult fabrication problems, the Custom Molder maintains extensive design and engineering facilities to serve you.

Staffed by technicians with long experience in plastics engineering, Custom Molders furnish you with first-hand information on the properties and performance of a wide range of Styron (Dow polystyrene) formulations.

It's your opportunity to get the most pieces possible per dollar spent. For the combination of Dow Research and the Custom Molders' designing know-how helps you to use to full advantage the excellent properties of Dow Plastics in your products. Write Dow today and let us put you in touch with a qualified Custom Molder, who will help solve your fabrication problem.

Plastics Division—Dept. SOT-19

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

DOW *Plastics*

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PLASTISCOPE

The physical quantity of sales increased in 1949, but lower prices in both cellulose and naval stores products reduced profits and the dollar volume of sales. Nevertheless, the company paid a 16% increase in dividends on common stock.

Research expenditures in 1949 were $4,237,000; construction expenditures totaled $7,407,000, about the same as in 1948 with an expected increase in 1950.

The tremendous growth of the company over a period of a quarter of a century is indicated by a sales figure of $21,240,000 in 1925 compared to the $121,000,000 figure in 1949.

An active demand for cellulose acetate for both rayon and plastics during the fourth quarter of 1949 more than compensated for an earlier decline, and brought cellulose acetate volume for all uses to a new high for the end of the year. Flame-resistant cellulose acetate plastic formulations were held particularly responsible for part of the increased sales.

Sales of nitrocellulose, although slack during the spring and summer, rose in the last quarter to about the same level as the last quarter of 1948.

U. S. Rubber Co. reported net profit in 1949 of $15,100,072 after taxes, compared with $20,141,585 in 1948. Consolidated net sales were $517,439,676 in 1949 compared to $572,024,663 in 1948. Sales were affected by the general downward trend in the rubber business. An average of 56,521 employees were at work in comparison to 64,208 in 1948. The company paid retirement allowances of $1,234,102 to former employees. Additions to property and plant, including the acquisition of the former Glenn L. Martin plant at Painesville, Ohio, amounted to $16,184,600.

Dow Chemical Co. reports that in the six months ended Nov. 30, 1949, net income increased to $15,133,416 from $14,467,722 for the corresponding period of 1948. This amounted to $2.68 a share compared with $2.64 earned a year before.

Dewey & Almy Chemical Co. reported that sales in 1949 exceeded 1948 sales of $15,863,148. In the last six months, sales broke all past company records and topped any previous monthly totals.

Koppers Co., Inc., sales in 1949 amounted to $191,386,481 with total net earnings of $7,111,997. In 1948, total sales and income from other sources amounted to $200,852,859 with net earnings of $10,552,825.

Plymouth Rubber Co. announces that sales of $11,236,934 for the year ending Nov. 30, 1949, increased from $10,631,190 in the similar period of 1948.

Admiral Corp. net income for 1949 was estimated at $8,000,000 compared to $3,600,000 in 1948.

The Watson-Standard Co.'s net income for the 12 months ending Nov. 30, 1949 was $193,541 compared to $171,737 in 1948.

COMPANY NEWS

Roth Rubber Co., Cicero 50, Ill., has announced the appointment of **Ansel B. Hendron** as its new sales engineer.

Godfrey L. Cabot, Inc., 77 Franklin St., Boston, Mass., carbon black manufacturer, has a new film called, "A Study in Black," showing how carbon black is made an essential part of printing inks, paints, varnishes, lacquers, and plastics. The premiere showing was made in New York with Thomas D. Cabot, vice president and treasurer, presiding and addressing an audience of prominent industrialists.

Plastic Molding & Engineering Co., 701 Locust St., Pittsburgh 19, Pa., is the new name of the organization formerly known as **Plastic Div., Penn Supply Co.** The new firm will continue in the field of custom molding of thermoplastic and thermosetting plastic materials with increased capacity.

G. R. Carrier, 1815 W. 95th St., Chicago, Ill., has been appointed representative of **Hydro-Line Mfg. Co.,** Rockford, Ill., to handle the company's air and hydraulic cylinders and special machinery in the Chicago and northern Illinois area.

Julian Cerf, 267 Fifth Ave., New York, N. Y., announces a protective material available for lining shipping containers for articles requiring high moisture vapor transmission and waterproof protection at the same time. This material is a synthetic rubber-impregnated paper base to which a vinyl coating has been fused. For greater durability, the paper is also available with a cheesecloth backing. This material does not stick, crack, or oxidize. It is sold in widths ranging from 36 to 54 in. in rolls up to 300 yd. long, and costs less than any similar product now known to be on the market, says Mr. Cerf.

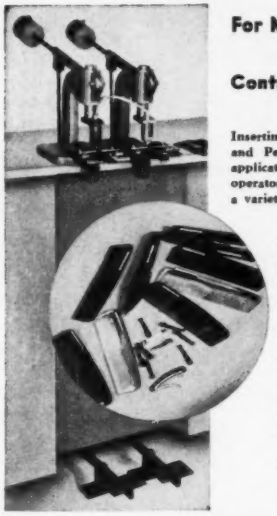
Centro Research Laboratories, Briarcliff, N. Y., has announced appointment of **Dr. Jacobus Rinse** as associate director. He has been chemical director of Chemisch Technisch Aviesbureau, Haarlem, Holland, which is one of the large industrial research laboratories in Europe, and has done considerable work in organic coatings and plastics. His move to this country will facilitate collaboration between the two laboratories.

Nylon Molded Products Corp. is the new name of the company formerly known as **Tartan Molders.** The company, specializing in custom molding of nylon and polyethylene, is still located at **1311 E. 125 St.,** Cleveland, Ohio.

American Electro Products, Inc., 1358 Thomaston Ave., Waterbury, Conn., has announced completion of facilities for metallizing plastics with a newly developed procedure. All types of plastic materials may be handled by this method, which is particularly well adapted to metallizing large plastic items where

New!

THERMO-FORCE PRESS



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Inserting Metal Clips in Combs and Pencils . . . averaging 15 applications a minute with one operator . . . gauges in stock for a variety of inserts and products.

Let our engineering staff solve your fastener problems.

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- automatic cut-off machines
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- jig saws, large and small
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Accepted by the Trade Since 1922

BARKER - DAVIS MACHINE CO., INC.

91 Mechanic Street • Leominster, Mass.

ACE *gives you* Ace-High Quality in **PLASTIC BALLS**

COMPLETELY SEAMLESS PRECISION FABRICATED

- All sizes (⅛" to 1¾")
- All plastic materials
- A wide variety of colors

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Complete facilities for fabricating plastic parts for all industries. Estimates submitted promptly upon receipt of your blueprints or specifications.

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Precision Plastic Fabricators

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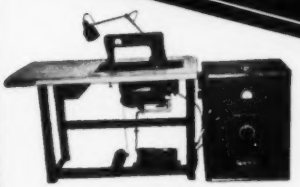
MAYFLOWER ELECTRONIC GENERATORS

Generators of 250 watts to 15 kilowatts, at frequencies best suited to furnishing a basic source of radio frequency heat for average applications.



Electronic Bonding Machines

Manufactured under RCA Patents

Single or dual wheel applications for electronic sealing of thermoplastic film and sheet at speeds to 50 ft./min. Binds, hems, straight seals or turns.

- ELECTRONIC BAR SEALERS for fast permanent seals. 30 different press sizes available
- AUTOMATIC GROMMET AND BUTTONHOLE MACHINE for reinforcing rainwear and similar applications.

Our engineers analyze every application where electronic heat is required in a plant and fit the equipment to "overall" requirements and not to a single job

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for VINYL PLASTISOLS • ORGANISOLS • EMULSIONS

AS WELL AS REGULAR VINYL MILLED AND CALENDERED FILMS . . . A BETTER STABILIZER FOR HIGH TEMPERATURES, ULTRA-VIOLET AND OUTDOOR AGING . . . .

Here is a newly developed stabilizer in paste form for high temperatures, ultra-violet and outdoor aging that improves other properties in vinyl films as well . . . It gives excellent light fastness, improves the transparency of clear films and gives films that do not absorb water and do not "blush" . . . It is compatible with all tested pigments — even organic reds hold their hue and age well when used with it.

Write for complete data

HARWICK STANDARD CHEMICAL CO.

AKRON 5, OHIO

BRANCHES: BOSTON, TRENTON, CHICAGO, LOS ANGELES

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controlled thicknesses of metal may be deposited over the entire surface or on selected areas only. The final surface may be copper, nickel, silver, gold, or any other metal specified.

Vertrod Corp., 17 Williams Ave., Brooklyn 7, N. Y., has developed an electro-formed mask for use in spraying paints and lacquers on complex objects. The masks are designed especially for multicolor work and are recommended for small parts in particular. Labor saving is made possible by the use of multi-cavity panels whereby a dozen items like dolls can be sprayed simultaneously as easily and quickly as one at a time. Seamless slush molds for the manufacturer of vinyl and latex products can also be made by the same electro-forming process used for the spray masks.

The Pulva Corp. has been formed by **F. Elmer Oswald**, who recently resigned from **Pulverizing Machinery Co.** The new company, with plant and offices at 550 High St., Perth Amboy, N. J., will manufacture impact precision-type pulverizers for granulating, wet milling, and fine grinding.

American Cyanamid Co., Calco Chemical Div., Bound Brook, N. J., has announced the following appointments: **B. W. Henderson** will become manager of the Intermediate and Rubber Chemicals Dept. **Dr. W. A. Raimond** has been named departmental technical director for dyes and **Dr. W. P. Munro**, chief chemist, Dept. G. of Dyes Mfg. Div. **Quintin T. Dickinson** is manager of the new Coal Tar Chemicals Dept. and **W. C. Harmon, Jr.**, is manager of the purchasing department.

The Standard Machinery Co., Mystic, Conn., has appointed **Walter H. Del Mar** and the **W. H. Del Mar Co.**, 5140 Crenshaw Blvd., Los Angeles, Calif., Pacific Coast representative for Davis-Standard extruding machines and accessories for the plastics, rubber, and wire industries. Mr. Del Mar is also Pacific coast manager for **Adamson United.**

Creative Plastics Engineering Co. is now located at 1912 Milwaukee Ave., Chicago, Ill. The company specializes in small injection pieces—particularly for surgical specialties—and polystyrene master parts used in the centrifugal casting process.

Presto Plastic Products Co., Inc. has transferred its sales offices from 40 Worth St. to new and larger quarters in the Empire State Building, 350 Fifth Ave., New York, N. Y. This move complements the announcement made two months ago that Presto had enlarged its capacity in its Brooklyn manufacturing plant by adding a 72-in. calender for vinyl film and an extruder to produce 96-in. polyethylene film. Presto Plastics is an associate company of **J. P. Frank & Co.**

The John Hewson Co., 106 Water St., New York, N. Y., has expanded its rubber and plastics divisions. **Harry Bradbury** has been appointed specialist and consultant in charge.

B. F. Goodrich Chemical Co. announces three new appointments; **George B. Koch** has been named staff representative for chemical sales to direct the promotion of agricultural chemicals; **F. L. McNabb** has been appointed staff representative for Hycar and rubber chemicals; **M. W. Osborne, Jr.**, will succeed Mr. Koch as advertising and sales promotion manager.

Walker, Van Deusen & Co., 614 Volunteer Bldg., Chattanooga, Tenn., is now sales representative for **The Richardson Co.**, Melrose Park, Ill., in the Southeastern area, and will promote particularly the new decorative laminate line called Plastok Decorative.

Champion Glove Corp. has just been formed with factory and executive offices located at 850 Metropolitan Ave., Brooklyn 11, N. Y. The new company, of which **Louis K. Braunston** is president, will manufacture plastic-coated industrial work gloves by the firm's patented formulation process known as Champlex.

A special department has also been set up to coat wire, metal parts, cord, belting, tools, and so forth, by the Champlex process.

Koppers Co., Inc., has established an international sales section to manage and coordinate sales of the company's products and "know-how" abroad. **S. C. Whitehouse**, former manager of export sales for Koppers Chemical Div., has been appointed international sales manager and will be responsible for foreign sales of all products. Headquarters of the new section will be in the company's general offices in Pittsburgh.

The Connecticut Plastilight Corp., 481 Canal St., Stamford, Conn., produced and sold in excess of two million sq. ft. of decorative plastic surfacing during 1949, according to **Victor Hugo-Vidal**, president. Company records show a more than 100% increase in production over 1948. Three more hydraulic presses have been added to the company's equipment.

PERSONAL

Clyde W. Gray has been appointed executive vice president of **Stowe-Woodward, Inc.**, Newton Upper Falls, Mass., manufacturer of rubber-covered rolls and Ebonite bowling balls. Mr. Gray was formerly with Ford, Bacon & Davis.

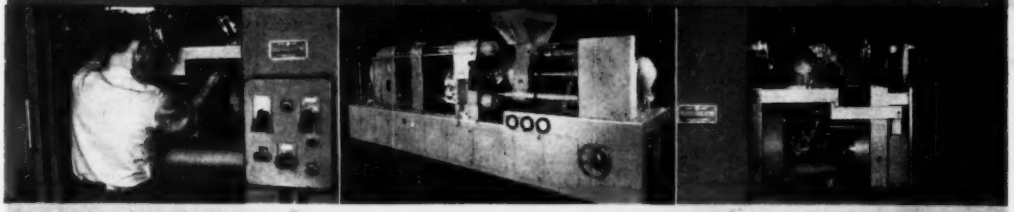
James H. Binger has been elected vice president and general manager of the **Belfield Valve Div.** (Philadelphia) of **Minneapolis-Honeywell Regulator Co.** Mr. Binger joined the company in 1943.

Dewey Rainville has been appointed sales manager of **Ball & Jewell, Inc.**, Brooklyn, N. Y., manufacturer of patented rotary cutters used in plastics grinding.

Dr. John H. Lux has been named manager of the **New Product Development Laboratory, General**

A big feature of our exhibit at the National Plastics Exposition will be the ADMIRAL 16 inch clear plastic TV Escutcheon pictured here. Make a note of BOOTH NO. 139 or tear this page for a pocket memo. You'll see this largest one-piece thermoplastic escutcheon assembled in place on a fine ADMIRAL 16 inch TV set. Come visit with us at Navy Pier, Chicago—March 28th to 31st—get all the interesting facts concerning successful Santay Injection Moldings on giant 40 ounce and 60 ounce equipment like that illustrated below. ★ SANTAY can bring to your production problems all the knowledge, experience and extensive facilities developed during 30 years of pioneering and specialization in designing, tooling, molding and finishing thermoplastic parts and products. Many of our country's largest and most particular buyers send their TOUGHEST jobs to Santay. Ask us, now, for suggestions, samples, and moderate cost estimates on your needs. No obligation.

Santay



SANTAY CORPORATION

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INJECTION MOLDING • METAL STAMPING • ELECTRO-MECHANICAL ASSEMBLIES

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Electric Co. Chemical Dept., succeeding **Dr. J. J. Pyle**, who is now engineering manager of the **Laminated and Insulating Materials Div.**, Coshocton, Ohio. Dr. Lux's headquarters will be in Pittsfield.

Stanley Bindham has acquired a part ownership in **Gemloid Corp.** and will become president succeeding **J. Frank** who will devote himself to other interests. Mr. Bindman was previously manager of manufacturing of **Noma Electric Corp.**

M. W. Burkhart has joined **Cambridge Molded Plastics Co.**, Cambridge, Ohio, as chief engineer. He has been manager of **Plastics Design & Sales Co.**, Newark, Ohio, and founded the **Newark Plastics Engineering Co.** which he managed until 1947. He is now president of the Central Ohio section of the Society of Plastics Engineers.

Frank X. Kiefer, formerly retail sales promotion manager of **Bakelite Div., Union Carbide & Carbon Corp.**, has been named assistant advertising manager. He has been with the firm since 1940.

Joseph A. Jackovics, representing **Columbia Protektosite Co., Inc.**, Carlstadt, N. J., manufacturer of injection molded plastics, is now on a three-month, round-the-world market survey for plastic products. Mr. Jackovics will visit Indonesia, as well as other Asiatic and European countries.

William A. Gerhardt has been named Los Angeles District Manager for **Reichhold Chemicals, Inc.**, succeeding **Frank E. Dillon**, who is retiring from active duty.

Harry B. McClure has received the first Commercial Chemical Development Assoc. Honor Award for outstanding contribution to this field. Mr. McClure, division vice president of the **Carbide & Carbon Chemicals Div., Union Carbide & Carbon Corp.**, has introduced to industry since 1931 approximately 200 synthetic organic chemicals not previously available on a commercial basis, which are now being used in applications such as plastics, synthetic textiles, protective coatings, and pharmaceutical synthesis.

Clarence McCormick of the sales organization of **Superior Plastics Div., Commonwealth Plastics, Inc.**, Chicago, Ill., was guest of honor at a dinner held on Dec. 22 in observance of his 10 years of service with the company.

Howard R. Erwin, former technical superintendent of the **Goodyear Synthetic Corp.** plant at Torrance, Calif., has been named special representative of the **Chemical Div., The Goodyear Tire & Rubber Co.** Mr. Erwin has been assigned to the Cleveland district.

Richard D. Dunlop has been appointed assistant general manager of the **Texas Div., Monsanto Chemical Co.** He has been with the company since 1933.

William J. Connelly, former manager of consumer relations, has been appointed assistant director of public relations for **Bakelite Div., Union Carbide & Carbon Corp.** He has been associated with the company for 10 years.

Richard L. Foote has been named director of plastics production sales for **The Richardson Co.**, Melrose Park, Ill. Mr. Foote was with **Synthane Corp.** for many years and served as chief of the Laminating Div. of the Plastics Section of WPB during the early part of the war.

James J. Wrasman has recently joined the Technical Sales Staff of **John H. Calo Co., Inc.** He was formerly with Synthetic Resins.

Dr. Edward F. Wagner has been named head of the recently reorganized **Technical Service Dept.**, of **Witco Chemical Co.**, 6200 West 51st St., Chicago, Ill. He has been associated with the company for the last five years.

MEETINGS

Apr. 4—S.P.I. Philadelphia Chapter Meeting, Sansom House, Phila.

April 10-14—American Society of Tool Engineers, Convention Hall, Philadelphia, Pa.

April 20—S.P.I. Boston-Providence Chapter Meeting and Dinner Dance, Hotel Beaconsfield, Boston.

April 24-27—National Packaging Exposition, Navy Pier, Chicago, Ill.

Apr. 25—Association of Consulting Chemists and Chemical Engineers, Hotel Shelburne, New York.

June 26-30—A.S.T.M., Exhibit of Testing Apparatus and Related Equipment, Atlantic City, N. J.

Aug. 7-19—United States International Trade Fair, Chicago, Ill.

Sept. 5-9—Chicago Section of the American Chemical Society, Sixth National Chemical Exposition, Chicago Coliseum, Chicago, Ill.

S.P.E. Meetings

April 6—Eastern New England Section of S.P.E. at Hotel Vendome, Boston, Mass. Dr. Harold Narcus, Electrochemical Industries, Inc., Leominster, Mass., will speak on "Metalizing of Plastics."

April 10—Upper Midwest Section of S.P.E. at Coffman Memorial Union, University of Minnesota, Minneapolis, Minn. Frank Donahue, Monsanto Chemical Co., will discuss "Trouble Shooting—Thermosetting Molding."

April 19—South Texas Section of S.P.E. in Houston. James R. Turnbull, general sales manager, Monsanto Chemical Co., will speak.

April 19—New York Section of S.P.E. at Hotel Shelburne, New York, N. Y. William J. Connelly, assistant director of public relations, Bakelite Div., Union Carbide & Carbon Corp., will deliver an address on "The Nature of Plastics."

In order to move them promptly, extremely attractive prices are available on Acadia Synthetic Products compression molded polystyrene sheets in all thicknesses from ½" to 1". These sheets have properties superior to those fabricated by other methods—no shrinkage at normal temperatures—better heat resistance. New low prices are also available on Saran*, Tenite, Vinylite and other thermoplastic sheets. Wire or write for quotations. (*Dow Chemical Co.)

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Processors of Synthetic Rubber and Plastics • Sheets • Extrusions • Molded Parts
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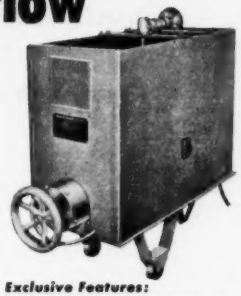
Magnaflow

CONTINUOUS FLOW MELTER



The Magnaflow Melter, designed and developed to melt Plastiflex hot melt mold material of specially modified vinyl base, is also adaptable to the efficient and economical production of any rubber-like specialties. It is ideal for melting or pre-heating a wide range of other thermo-plastics, granular asphalt, waxes, and similar compounds. *Write now, at no obligation, for full information on the Magnaflow Melter.*

Exclusive Features:

Continuous Flow—Available in capacities from one to six pounds per minute at a steady rate of flow.
Large Capacity—Up to 200 pounds of granulated material may be put in hopper at one loading.
Precision Controlled—Thermostatically held to any pouring temperature between 300° and 400° F. Ranges as low as 100° F. and as high as 650° F. are also available.
Easier Starting—Delivery at desired temperature begins in approximately 8 minutes from cold start.

Exclusive Sales Agents

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Dept. MP
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VINYL PRINTING MACHINES

- For vinyl and other plastic films
- Available in one to four colors
- Fully adjustable — accurate register
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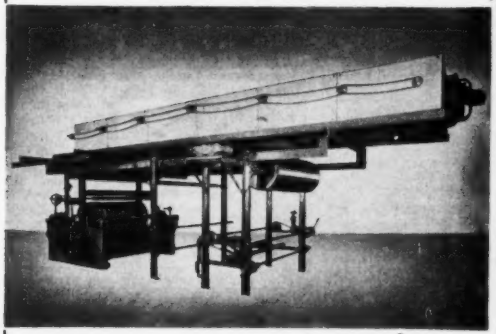

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Manufacturers of Printing Presses and Cylinders
Complete specifications and prices on request

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EMPLOYMENT • BUSINESS OPPORTUNITIES • EQUIPMENT (used or resale only)

Machinery and Equipment FOR SALE

FOR SALE: Molding Presses 100 ton and 150 ton Stokes Standard. Also one Watson Stillman 200 ton, 12" ram. All self contained units in perfect working condition complete with timers and controls. RODALE MFG. CO., INC., Emmaus, Pa.

SAVE WITH GUARANTEED REBUILT EQUIPMENT — HYDRAULIC PRESSES, 24"x24", 18" ram 318 tons; 24"x54", 200 ton, multiple opening; 44"x44", 16" ram, 250 tons; 24"x24", 12" ram, 170 tons; 24"x42", 2—12" rams, 340 tons; 48"x42", 16" ram, 250 tons; 36"x52", 14" ram, 385 tons; 36"x 36", 12" ram, 141 tons; 20"x18", 10" ram, 118 tons; 20"x20", 10" ram 118 tons; 19"x 24", 10" ram, 78 tons; 22"x15", 8" ram, 75 tons; 27"x21", 8" ram, 75 tons; 15"x15", 8" ram, 75 tons; 12"x12", 7½" ram, 60 tons; 12"x12", 6½" ram, 50 tons; 8"x9½", 4½" ram, 20 tons; 16"x16", 3½" ram, 12 tons; Laboratory Press 30 tons 6"x6", Mills Laboratory, M. D., THROPP 16"x40" M. D. Mill; NEW DUAL PUMPING UNITS, all sizes; Worthington Triplex 12 gal. 2200#; 4 plunger 6 gal. 2000#; Extruders; Royle Rubber & Plastic #2 units; PREFORM MACHINES, Stokes R & T, Colton 5½T and Stokes DDS-4 with Reeves Drives, also Mixers, Calenders, Vulcanizers, Accumulators etc.

UNIVERSAL
HYDRAULIC MACHINERY COMPANY
285 Hudson St. New York City 13, N.Y.

FOR SALE: Farrell 18" x 45", 16" x 48" & 15" x 36", 2 roll rubber mills. New 6" x 12" Lab. mixing mills & calenders. Other sizes 30" to 84". Royle #2 perfected extruder, and other sizes. 500 ton Hydr. molding press 42" x 48". Field 500 ton 20" x 30". Francis 175 tons 24" x 18". Albert 100 ton 2 opening 24" x 24". 40 ton broaching press. Also presses 20 to 800 tons from 12" x 12" to 36" x 36". Hydr. oil pumps, Vickers, Oilgear, Northern, etc. Watson-Stillman Hor. 4 plgr. 1" & 2" x 4" H. & L. pressure pump. HPM 1—3/8" x 6" vertical triplex 16 GPM 2700 lbs. Elmes 1" x 4" & 1¼" x 4" hor. 4 plgr. 5 & 8 GPM 4500 lbs. & 5500 lbs. Elmes 2" x 6" Horiz. 30 GPM 2500 psi. Rumsey 4½" x 8" vert. triplex 65 GPM 900 lbs. Elmes 2½" x 4" hor. 17 GPM 800 lbs. Hydr. steam pumps. Low pressure pumps 150 to 600 lbs. Hydr. accumulators. Stokes automatic molding presses. Stokes rotary preform tablet machines 1—3/16", 1—½" and ⅝", also single punch. Injection molding machines 2 oz. to 16 oz. Baker Perkins jacketed mixers 200, 100, 50, and 9 gals. capacity. New and used rotary cutters. #18H mikro Pulverizer, Rubber mills, calenders, Banbury mixers, etc. Heavy duty mixers, grinders, pulverizers, gas boilers, etc. Partial listing. We buy your surplus machinery. Stein Equipment Co., 90 West St., N. Y. 6, N. Y. WOrth 2-5745.

FOR SALE: 2—5½ T Colton preforming machines; 5—6" Downward moving ram presses 14 x 12 platen size—37½ ton capacity; 1—Warren Duplex steam pump, 5000# pressure, 18 x 2 x 18—100# steam pressure. Ser. #28215; 1—Davidson simplex steam pump 2500# pressure, 100# steam pressure; 1—6 x 4 Worthington Triplex pump motor drum 250 P.S.I. 50 G.P.M. Also some 8" ram and 10" ram presses; 1—Gemco blender complete with 7½ H.P. Motor controls, etc., practically new. Reply Box 327, Modern Plastics.

FOR SALE: Injection Presses: 2 & 8 oz Reeds, 2 - 4 and 12 oz HPM, 8 oz Lester, 1 oz vertical NRK. 4 Extruders: 3", 2½" NRM, 6" oil heatd. NE. 20' Conveyor, Ovens, Granulators, Tumbling Barrels, Temperature Circulators. Apex rd.obj. printing mach. Preco laborat. Press .1—HPM 9 oz Hasteloy Heating Chamber. 10—various types Compression Presses. 1—Laminating Press 16 op. 30" x 20" platens. 4—Stokes 150 ton mod. 252 autom. closure press. 5—Birdsboro 8" ram 24" & 24" Pl. Compression presses. 1—Eclipse 3 HP gas boiler. Kux No. 50 single punch, Kux No. 25 rotary Preform presses. Justin Zenner, 833 W. Sheridan Road, Chicago 13, Ill.

FOR SALE AT REDUCED PRICES
Stokes new RD3 and DD82 & Colton 3RP Rotary Tablet Machines.
Mikro 18H, 2TH & 4TH Pulverizers.
Jay Bee, U1 & 3 AT Schutz-O'Neill, Stedman, Rietz Mills.
Baker Perkins & Readco Heavy Duty 100-150 gal. Double Arm Jacketed Mixers.
J. H. Day 75 & 35 gal. Imperial, Double Arm Jacketed, Sigma Blade Mixers.
Day 15 gal. Pony Mixer
Day & Robinson 150, 600, 1000, 1200, 24000 & 4000 lbs. Dry Powder Mixers and Sifters.
Package Machy. FA, FA2Q, DF Cellophane Wrappers.
Knapp JS, Hayssen 3-7 and Scandia SSU1 Automatic Cellophane Wrappers.
Tell Us Your Requirements
UNION STANDARD
EQUIPMENT Co.
318-322 Lafayette St.
New York 12, N. Y.

FOR SALE: 100 Ton and 150 Ton Stokes Molding Press & Pumps; 300 Ton Dunning & Boschert, Molding Press; 200 Ton W. S. New Hobbing Press; 300 Ton W. S. Press 24 x 20 Platens; 175 Ton H. P. M. 30 & 20 Platens; 85 Ton Stewart Boiling 20 x 20 Platens With Electric Plates; 50 Ton 18" x 18" Elmes, With Electric Plates, Handpump Operated; 500 Ton Waterbury Farrel 3 Post Press; 800 Ton Waterbury Farrel 22" x 24" Platens; Watson-Stillman 75 Ton 15" x 15" Platens; 35 Ton Oilgear Shaft Straightener 84" Long Bed; Carver & Watson Stillman Lab. Presses; Hydro Pneumatic & other type Accumulators; Pisten & Oil Pumps. AARON MACHINERY CO., 43 Crosby St., N.Y.C.

HYDRAULIC PRESSES REBUILT TO SPECIFICATIONS for plastic items, industrial purposes and phonograph record presses. We have in the used equipment (1) Baldwin-Southward 8" x 8' stroke, 2000# W. P. weighted accumulator $2000, (1) 400 ton, 32 x 45, 18" ram, 36" stroke, 12' daylight $2200 (1) 300 ton 30 x 46, 18" ram, 24" stroke, $1800, (1) 400 ton 22 x 30, 16" ram, 18" stroke, 30" daylight $1500, (2) 150 ton 42 x 46, 12" ram, 36" stroke, 60" daylight $900 each, (6) 250 ton 32 x 66 12" double ram, 48" daylight, 15" stroke, flange type packing $1850 each. Hydraulic Sal-Press Co., Inc., 386-390 Warren Street, Brooklyn 2, New York.

FOR SALE: 2—15 ton Stockes Automatic Presses in operating condition. Box 404, Modern Plastics.

FOR SALE: ONE NEW STOKES, 15-Ton Rotary Press #D.D.S. 23" Depth of fill-16 Stations-core rods-motor-attractive price. Reply MERRIMAN BROS., INC., 185 AMORY STREET, JAMAICA PLAIN, MASS.

INJECTION MOLDING MACHINES FOR IMMEDIATE SALE
Two—12 oz. Lester-Phoenix
One—6 oz. Lester-Phoenix
One—6 oz. Reed-Prentice
Three—4 oz. Reed-Prentice
Two—4 oz. HPM
Three—2 oz. Reed-Prentice
Reply Box 318 Modern Plastics.

FOR SALE: BANBURY #9 and #11 mixers—still installed . . . . 5—18" x 48" FARREL BIRMINGHAM mills . . . 2—#2 Ball and Jewell cutters . . . . . 14—Stokes, Kux, Colton tablet presses—½" to 4". THESE ARE A FEW OF MANY ITEMS WE HAVE AVAILABLE. WHAT HAVE YOU FOR SALE & WHAT DO YOU NEED? CHEMICAL AND PROCESS MACHINERY CORPORATION, 146 GRAND STREET, NEW YORK 13, N. Y., WOrth 4-8130.

FOR SALE: 5 Dunning and Boschert Compression Molding Presses and various other items. Send for list. Greene Plastics, Inc., Wakefield, R. I.

FOR IMMEDIATE SALE: 11-75 ton hydraulic (rubber) presses platen 14" x 14", hand operated with steam and water valves, traps, gauges, piping, hot plates—also—1—80 H.P., 125 lb. like new automatic CLEAVER BROOKS boiler. Complete Hydraulic Accumulator System, H.P. pumps, control-reduction valves, tools, shop equpt. Open for inspection 9 A.M. to 5 P.M. MASTER RECORD Co. 2406 S. La Salle St. Chicago—Victory 2—1303.

Plastic Extruders For Sale:
One NRM 2½" Screw with Oil Heating Unit.
One Royle 4½" Screw.
One Royle 6" Screw.
All in good condition, priced reasonably.
Also New Drying Oven and 40' Conveyor.
Eric Bonwitt, 431 So. Dearborn, Chicago 5, Ill.

FOR SALE—Three National Erie Plastics Extruders Nearly New Condition, 6", 4½", and 3½" Screw Diameters. Details furnished on request. Reply Box 407, Modern Plastics.

Six Hydraulic Presses
Ex German Reparations

Pressures:	
Preliminary:	200 lbs. p.s.i.
Low:	1170 lbs. p.s.i.
Medium:	2640 lbs. p.s.i.
High	5100 lbs. p.s.i.
Dimensions (approx.)	
Ram Diameter	31"
Ram vertical movement	24"
Distance between pillars	33½"
Platen size	29¼"x29½"
Max. opening with loader	16"
ditto, without loader	24"
Size of base cylinder	69½"x69½"
Weight	42 tons per press (approx.)

Eight Accumulators
Total weight approx. 27 tons 13 cwt.
One Pump
"Weisse" capacity 455 litres per minute to a height of 470 metres driven by direct coupled Siemens Schuckert 90KW motor. Weight 2 tons 10 cwt. All equipment in excellent condition, manufactured 1940; at present stored in Australia. All enquiries to L. E. BOWMAN & CO. PTY.LTD. Commercial Road, Roselle, Sydney, N.S.W. Australia.

Machinery and Equipment Wanted

WANTED: Complete plants, also individual items such as: Mixers, grinders, 2-roll mills, extruders, etc. Reply Box X310, Modern Plastics.

WANTED: #235 and #200D3 Stokes Automatic Molding Presses by electrical manufacturer. Please write Box X311 Modern Plastics.

"Desire purchase used Lester eight ounce Injection Press. Require full particulars and price." Reply X401, Modern Plastics.

WANTED: 4, 8 and 16 ozs. injection presses, good condition. Preferable Midwest location. Reply Box X323, Modern Plastics.

WANTED: 1½" Extruder, preheater, cooling unit, conveyer. Must be in excellent working condition. State Manufacturer's name, price, purchase date and usage. Not interested in machines out of metropolitan New York area. Send sample strip of last material extruded. Reply Box X319, Modern Plastics.

WANTED: Stokes model 250 or 250-A 50 ton compression molding press. Write giving condition of machine, serial number & price. Reply Box 403, Modern Plastics.

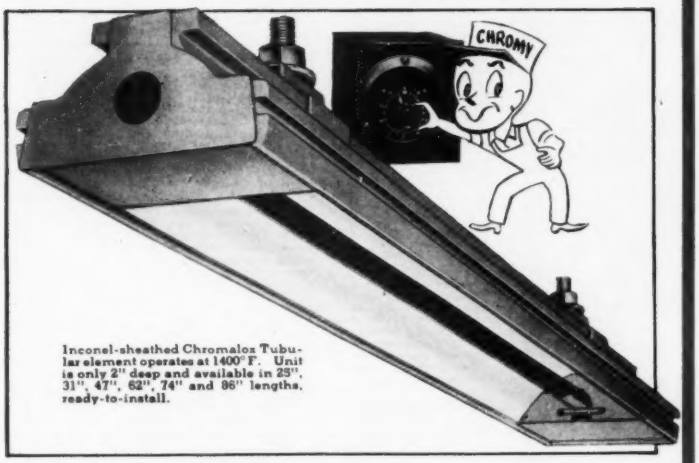
Material For Sale

FOR SALE—SACRIFICE
ZYLONITE—922 Sheets
Of Cordova 21" x 50" x .150". Three shades. Also 32 demi-blonde, 4 Tinsel samples on request. All at 50% off list. E. J. McGuire-Shuron Optical Co., Inc., 242 Andrews Street, Rochester 4, N. Y.

(*Continued on page* 244)

NOW **Dial** YOUR

INFRARED HEAT



Inconel-sheathed Chromalox Tubular element operates at 1400° F. Unit is only 2" deep and available in 25", 31", 47", 62", 74" and 86" lengths, ready-to-install.

WITH CHROMALOX ALL-METAL *Electric* Radiant Heaters

Uniform, exact heat when you want it is yours at the turn of a dial when you use CHROMALOX Electric Radiant Heaters as your heat source for infrared drying, preheating, baking, curing, dehydrating and similar applications.

Quickly and easily installed CHROMALOX Radiant Heaters give uniform heat without hot spots; operate efficiently in low and high ambient temperatures; provide glareless radiation in wave lengths absorbed more efficiently by all colors, textures and surfaces. All-metal construction enables units to withstand shock, vibration, dust, moisture; and eliminates hazards of contamination.

Write today for details on how flexible and dependable CHROMALOX Radiant Heaters can save time, materials and money in your plant.

DIALED INFRARED HEAT WILL GIVE YOU ALL THESE ADVANTAGES . . .

EXACT HEAT CONTROL
Finger-tip control at the turn of the input controller knob assures consistent, exact operating temperatures every time!

QUICK CHANGE-OVERS
Within a few minutes after the input controller is reset, you have a new heat to meet changed temperature requirements.

PRECISE DUPLICATION
It's easy to duplicate required working temperatures day-in and day-out without guesswork by setting the input controller dial to the logged temperature point.

MULTI-PURPOSE or ZONED OVENS
Various zones of heat are possible within the same oven by setting up separate controls for each bank of units. Then each bank can be individually controlled by its own dial.

CHROMALOX } *Electric Heat for Modern Industry*

FACTS ABOUT APPLICATIONS USING CHROMALOX RADIANT HEATERS

Many plants, faced with increasing production costs, have substantially cut working time and costs by using Chromalox Electric Radiant Heaters. If you use heat in your plant for processing, perhaps, you too can benefit by changing to Chromalox Electric Radiant Heat. Look over the typical applications below . . . then send for the full story about this modern heat source.

Application Report 101:
LESS FLOOR SPACE—SAFER OPERATING CONDITIONS are features of a Radiant Heater installation that also provides faster, continuous production for forming soft balls in heated metal molds.

Application Report 102:
SPEEDIER DRYING, NO HOT SPOTS with Chromalox Radiant Heaters result in complete and uniform drying of plastic powders in 10-15 minutes, compared with half-hour with previous heating method.

Application Report 104:
NO DISCOMFORT FOR OPERATOR of punch press while punching holes in plastic strip material. Radiant Heater is used to maintain proper temperature in strips between preheating oven and press.

Application Report 105:
OPERATING IN HIGH AMBIENT TEMPERATURES, Chromalox Radiant Heaters provide a more efficient method for more uniformly knitting asphalt to battery cases. Variable control adjusts heat to battery heights.

Application Report 109:
NO GLARE TO ANNOY PERSONNEL is one feature of Chromalox Radiant Heaters used to dry a cement seal in base of television tubes. Heaters operate on an open conveyor.

Get the complete RADIANT HEATER Application Reports!

Yes . . . send me full details on Chromalox Radiant Heaters.

Name _____

Company _____

Street _____

City _____ Zone _____

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Mail to: EDWIN L. WIEGAND COMPANY
7503 THOMAS BOULEVARD
PITTSBURGH 8, PA.

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CLASSIFIED ADVERTISING

(Continued from page 242)

SHEET PLASTIC
Cellulose Acetate and Cellulose Nitrate
Clear Transparent
Colored Transparent
Opaque and Translucent Colors
Also Clear Transparent Acetate Rolls. Stock on Hand. Samples and quotations on information concerning your requirements.
CELUTONE COMPANY,
23 East 26th St., N. Y. 10, N. Y.

Money making housewares and smokers items to place on royalty with reputable manufacturers, patented and patent pending. All new—no junk. Novelty, eye appeal. Enormous sales potentialities. Distribution through national chains. Professionally styled for injection molding from low cost dies. Assembling reduced to the very minimum. Particulars on request. Box X314, Modern Plastics.

FOR SALE: Six hundred fourteen sheets White "Pyralin" 20 x 50 x .010 thickness, H Linene Finish, at 91¢ per sheet.
TRANSPARENT CELLULOID SHEETS: 903 sheets 20 x 50 x .0075, 73¢ per sheet—mfgrs. cost; 1,334 sheets 20 x 50 x .0050, 48¢ per sheet—mfgrs. cost plus 25¢ a sheet to apply H. M. finish. Samples upon request. High discount for cash. Subject to prior sale. Reply Box X316, Modern Plastics.

FOR SALE:—15 tons Arocior 1270; 15 tons Brown Molding Powder, Cresylic Type; 2 tons each Black Bakelite 1895 and 6102; 5 tons Recovered Cellulose Acetate; 3 tons Recovered VYHH. Chemical Service Corp., 96-04 Beaver St., New York 5, N. Y.

Materials Wanted

WANTED: PLASTIC Scrap or Rejects in any form. Acetate, Butyrate, Polystyrene, Acrylic, Vinyl Polyethylene, etc. Also wanted surplus lots of phenolic and urea molding materials. Custom grinding, magnetizing and compounding. Reply Box X312, Modern Plastics.

WANTED: Plastic scrap. Rigid Vinyl, Cellulose Acetate, Polystyrene, Polyethylene. Custom grinding, magnetizing, compounding, and straining of contaminated plastics. Franklin Jeffrey Corporation. 1871 McDonald Avenue, Brooklyn, N. Y. ES 5-7943.

"Interested in purchasing virgin and reground acetate in pastel colors and crystal, also reground vinyl chloride, suitable for injection molding". Reply Box 313, Modern Plastics.

WANTED: Plastic Tiles of types recently used for manufacturing ladies novelty handbags. Send sample and prices; also quote on mold, if for sale, giving specifications. Luis Rocha & Co., Inc., 152 West 42nd St., New York 18, N. Y.

Molds Wanted

WANTED: Measuring spoon & measuring sample of shot. Northwest Plastics, Inc., cup molds. Advise size of mold, No. of cavities of each, age of mold, prices, send 65 Pinto Avenue, St. Paul 1, Minnesota.

INJECTION MOLDING COMPANY located on Eastern seaboard wishes to purchase or rent on a royalty basis molds for toy, novelty, houseware, medical and industrial items. Reply with samples to Box X410, Modern Plastics.

MOLDS FOR SALE

FOR SALE: Four cavity ladies' hanger mold. Products now being used by National Chain Store organization. Built by well established and reputable manufacturer. Reply Box 402, Modern Plastics.

Help Wanted

PHENOLIC RESINS
POSITION OPEN FOR CHEMIST OR CHEMICAL ENGINEER WITH A MINIMUM OF THREE YEARS EXPERIENCE IN PHENOLIC RESINS PRODUCTION, QUALITY CONTROL AND RESEARCH. PERMANENT POSITION WITH LARGE NORTHEASTERN MOLDING POWDER MANUFACTURER. SUBMIT PERSONAL DATA, EXPERIENCE, DATE OF AVAILABILITY AND SALARY EXPECTED IN FIRST LETTER. BOX X326, MODERN PLASTICS.

Wanted man to take full charge actual production three plastic extruders in custom shop flexible and rigid materials middle West write full particulars Box X324, Modern Plastics.

WANTED: Experienced night foreman (4-12 shift) in small compression molding plant in New Jersey, approximately 25 miles from New York City. Send full resume, including salary requirements. Reply Box X322, Modern Plastics.

REPRESENTATIVE wanted. Several territories are open to experienced representative in custom plastics sales, on *commission basis*, for molder equipped to do compression-transfer and injection molding. Please state experience and territory in which you are now operating. Box 309, Modern Plastics.

PLASTICIZER SPECIALIST: Established Chemical Company in Eastern New York needs a man for the sales organization to contact vinyl compounders and rubber industry as technical representative on plasticizers. Requirements are a technical chemical education with a minimum of two years in sales or engineering in the vinyl or rubber industries. Reply giving age, details of previous employment, salaries, and reason for leaving. Reply Box X328, Modern Plastics.

FILM EXTRUSION EXPERT:
CHEMIST OR PRODUCTION MAN
Experienced and fully familiar with the technique of extruding thin gauge, tubular and flat polyethylene film and able to assume full charge of production. An important opportunity is offered to the right man. Write fully in strictest confidence and state salary desired. Location: New York. Box X329, Modern Plastics.

RESIN MANUFACTURER wants Representatives; experienced in sales UREA Resins—liquid and powder, for furniture, plywood and paper trade, etc. Will make permanent commission or salary arrangement, or both, as desired. New England and Middle West territories open. Confidential. Our men know about this advertisement. Reply Box X405, Modern Plastics.

ESTABLISHED FACTORY REPRESENTATIVE WANTED. Established 1932 Injection and Compression Molding Plant desires live wire, full U. S. coverage, representation to solicit business, commission basis on ready items and custom novelty, toys, premium and industrial items, long runs. We cannot be undersold. Box 406, Modern Plastics.

JOBBERS WANTED: Nationally known distributor has good volume numbers of extreme interest to house furnishing, hardware, stationery, drug, and gift stores. Complete details requested first letter. Reply Box 408, Modern Plastics.

Situations Wanted

ASSISTANT EXECUTIVE, 28, engineering degree, 3 years experience with compression, transfer, and injection molding techniques. Background includes performance of molding operations, mold design, production control, rate setting, estimating, and plant operation. Personable and capable of handling correspondence and outside contacts. For past three years employed in physicist mainly in administrative capacity with responsibility for planning and supervising research (non-plastics industry), staffing field expeditions, and writing final reports. Desire to re-enter plastic molding or allied field if offered job with good possibilities for advancement in progressive, growing concern. Reply Box 400, Modern Plastics.

AVAILABLE: Married man, 29 years old, two children. Knowledge of all fields of Plastics. Junior engineering training. Presently employed as Field representative, Production Manager and Consultant with Fabricator and Injection Molder. Experienced in estimating, product design. Sales engineering and administration. Will sacrifice salary for opportunity to be associated with going organization. High principles of character and service. Reply Box 412, Modern Plastics.

AVAILABLE NOW: Bookkeeper, Office Manager; 15 years experience with Plastic Products firm, interested only in top-ranking position. Experienced every phase of office routine. Can furnish excellent references. Reply Box 320, Modern Plastics.

MOLDING TECHNICIAN PRODUCTION FOREMAN: Hard working, conscientious man, 43 years old, desires opportunity for advancement and better use of his abilities. 8 years experience in thermoplastic molding and development. Excellent working knowledge of mold design and time estimates. Able to plan and organize. Eastern location preferred. Please reply Box 411, Modern Plastics.

VINYL CHEMIST—Young graduate chemist with six years experience in development and production of vinyl compounds. Have been completely responsible for all compounding as well as new compound development and materials evaluation. In addition to the above have had extensive experience with all types of extrusion equipment. Desire position with responsibility and future. Send reply to Box 321—Modern Plastics.

Miscellaneous

MANUFACTURER WANTED: Sales Engineers opening Los Angeles office in July—heavy sales and shop experience—compression, transfer, injection extruding plants, know latest mechanical, electronic, advances, can give full coverage in California on all types equipment and materials. Highest references plus ability to produce. Reply Box X308, Modern Plastics.

Plastic Fabrication Shop in Miami, Fla. Established 10 years. Specializing in custom work. Proprietory line of aircraft replacement parts. Owner must devote full time to other business and this is a real opportunity for someone. Will sell at cost, no key money nor goodwill. Cheap rent for perfect factory set-up. Inventory and machinery 15 to 18 thousand dollars. Minimum $10,000 cash required. Address Owner, P.O. Box 51, Coconut Grove, Miami 33, Fla.

Leading Swedish moulding powder factory (Urea) wishes to consult a skillful expert with many years experience in the manufacturing of first quality moulding powder (Urea). Reply to "8.41", Gumaelius Advertising Agency, Stockholm, Sweden.

Scandinavian importer of tubes in bulk seeks connection with producer of standard type and quality plastic tubes, suitable for ordinary water and sewage purposes; drainage, roof-gutters, for the covering of electrical wires and cables, etc., able to compete with usual soil, etc., tubes in price and quality. Apply box "1287", A/S Hoydahl Ohme, Oslo, Norway.

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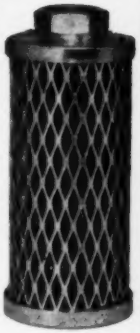

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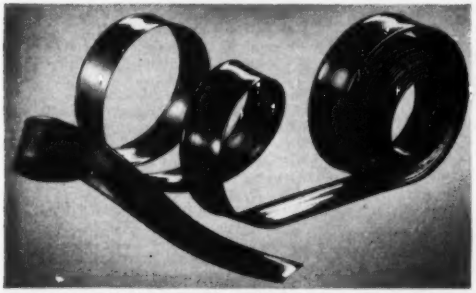

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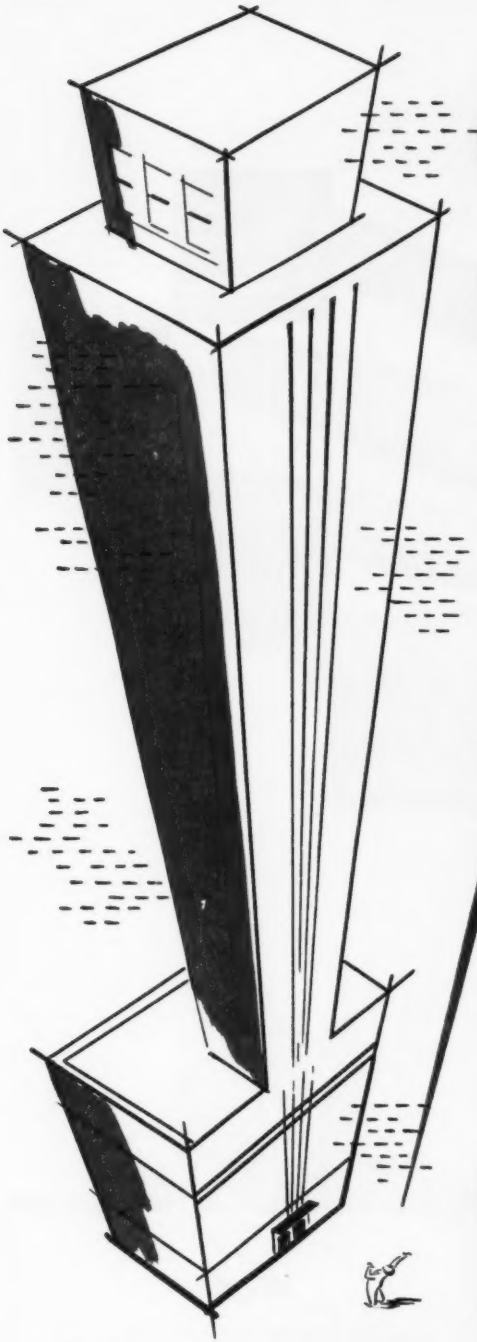

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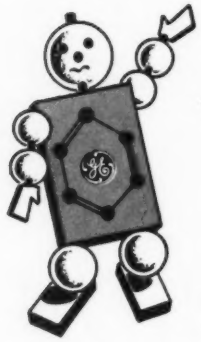

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CD50-D1